INITIAL * SEPTEMBER 19.47 CONGRESS JOURNAL *

AMERICAN MINING CONGRESS' NEW HEADQUARTERS



Offices of the American Mining Congress are now established on the 11th Floor of this newly erected, airconditioned building. We look forward to the pleasure of greeting our members and friends in these new quarters.

These modern offices will aid in providing the full measure of efficient service that the expanding membership and activity of the American Mining Congress require. More than ever, representation of the mining industry in the Nation's capital will be on a plane in which every mining man can take pride.

THE RING BUILDING EIGHTEENTH AND M STREETS, N. W. WASHINGTON 6, D. C.

What's Tougher Than 15 YEARS of SUMMER RAIN AND COAL DUST? ...ALCOA ALUMINUM CORRUGATED SHEETS

At the breakers of The Philadelphia & Reading Coal & Iron Company, about four miles of conveyor belts are roofed with Alcoa Aluminum Corrugated Sheets. Both surfaces of the aluminum are blanketed under layers of coal dust. Rain and moisture quickly bring out all the sulfates and meanness in this coating. The pH of the mixture of water and coal is about 2.6 . . . very high on the acid side, and quick poison for most metals.

But not for Alcoa Aluminum! After 15 years of service, these aluminum covers were inspected. The deepest penetration of the aluminum on representative samples was only 0.004"... after 15 years! The average depth of penetration was less than 0.001". The verdict of the inspectors was "Good for years and years more service".

When you come up against tough or severe corrosion problems in the structures you build, investigate "Alcoa Aluminum". It's available in sheets, structural shapes, and every commercial form, in a wide range of alloys to meet all conditions of service. Aluminum Company of America, 1764 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA ALUMINUM



IN EVERY COMMERCIAL FORM

CONGRESS JOURNAL

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FOR SEPTEMBER, 1947

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For Money In Your Pocket PERFORMANCE

Resists Kinking

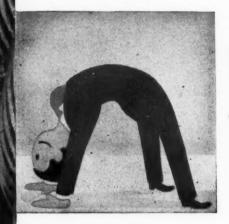
Being free from internal stress, it is always easy to handle—never fights back.



Spools Better

Even with a light load, it spools uniformly—is never cranky.





Takes Reverse Bends

Takes this
"fatigue" much
better, as on
rope-ruining
elevator
installations.



Safer to Handle

Worn unionformed ropes handle as safely as new, as broken outer wires lie close to rope.

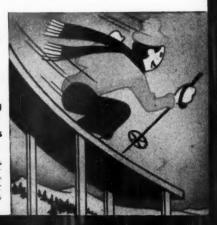
Always Relaxed

While it is flexible, and pliant, it has the "toughness" to withstand strain and weight.



Behaves on Grooves

Resists rotating or twisting in sheave grooves because wires are Preformed.



Specify



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THE ULTIMATE IN LOW COST WIRE ROPE

Precision Constructed 10 OUTPERFORM ordinary Wire Rope

FIGHT! FIGHT! There is an exhausting fight going on all the time in ordinary wire rope, Each wire is fighting constantly to get out of the fixed position into which it is forced without any preliminary training to put it in shape. This internal fighting spoils the performance, cuts it short, doesn't give you a run for your money.

In union-formed Wire Rope each wire is put in shape (Preformed) before it ever touches another wire in the rope. The result is exactly the same that comes from a set of conditioned muscles, i. e. finer coordination, greater endurance, top-flight kind of performance that does not let you feel out-of-pocket.

Yes sir! You will always get the most out of the best. The little extra you invest for the best is the part of your investment which will bring the payoff-vield the most dividends. Prove this fact to your own satisfaction. Specify unionformed - get money-in-yourpocket performance.



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They're Ready

CARSET JACKBITS



CARSET
JACKBIT
after drilling
307 FEET

in Barre Granite with a DA-35 Drifter at 90 psi You have been hearing about the new Ingersoll-Rand CARSET bit with CARBOLOY cutting edges. Here it is-an alloy steel bit with cutting edges of tungsten carbide, the hardest metallic substance made by man. Although developed with heavy drifters and high air pressures, the Carset Jackbit is in keeping with, and ideally suited to, the modern trend toward smaller machines and smaller holes, The amazing performance of this new ultra-bard tipped bit is due in part to its use with the recently announced "Jackstud" bit connector. Reports from mines and tests in our development work indicate the Carset bit to be one of the greatest advances in rock drilling history. We are confident that the Carset Jackbit opens the door to a new era in rock drilling. Performance and specific advances read like a driller's dream.

FOR INSTANCE, YOU CAN-

Drill continuously with one size bit
Use steels as long as the setup will permit
Increase drilling speeds 20% and higher
Almost eliminate the changing of bits
Drill small, uniform diameter holes
Materially reduce explosive costs
Drill the hardest rock
Reduce or even eliminate bit reconditioning
Use lighter drills
Drill more holes with the same amount of air

Drill more holes with the same amount of air Finish more rounds per month

Order some Carset Jackbits and Stud Jackrods now and determine the economics of their use in your own operation.

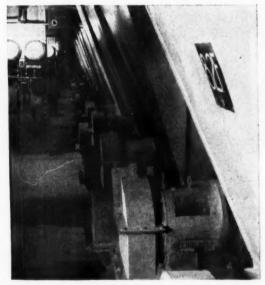
Ingersoll-Rand

[Page 4]

How LINK-BELT Equipment Serves A LARGE LEAD CO.



At left is section of elevator, 65 ft. high. In center and at right are seen horizontal screw conveyors.

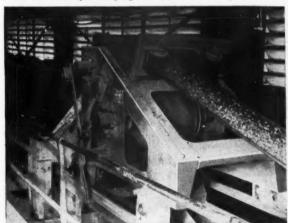


Bank of motorized speed reducers, driving screw conveyors as seen in photo directly above.

From the broad Link-Belt line of conveying and power transmission machinery, a size and type is available to meet every requirement. Let Link-Belt specialists in conveying, materials handling and power transmission help you solve your problems. Materials are kept "on the go" at efficient speeds, coordinating various processes, by Link-Belt elevators and conveyors of many different types. Power is applied efficiently, machinery is driven at correct speeds, by Link-Belt drives and speed reducers. These few views give but a suggestion of the numerous items of Link-Belt equipment at work in all the mines of a large U. S. lead producer.



18 in. Pan Conveyor carrying sinter, travels 55 ft. per minute.



Tripper on belt conveyor 439 ft. long handling sinter or coke, at speed of 200 ft. per minute.



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Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta,
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FOR EVERY ELECTRIC DRIVE IN YOUR PREPARATION PLANT



In 1940, the first Tri-Clad* motor made big news in the coal industry. More horsepower-per-frame-size, trim, compact appearance—these were important features. But it was the extra protection we built into the rugged Tri-Clad motor design that really sold more than 1,220,000 Tri-Clad motors.

Today, Tri-Clad is a "family" name. Tri-Clad protection is available in almost every type of *Reg. U. S. Pat. Off.

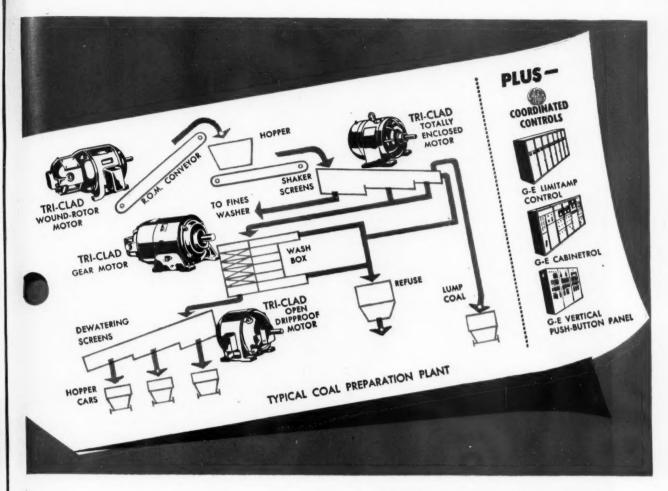
motor a coal preparation plant might use—open (dripproof) motors, totally enclosed motors, wound-rotor motors, gear-motors, vertical motors. This means you can now gain the advantages of Tri-Clad extra protection on all of your important drives.

EXTRA PROTECTION . . . AGAINST PHYSICAL DAMAGE!

A rigid cast-iron frame and end shields to protect vital motor parts from external abuse. Strong resistance of cast iron to corrosion. Tight, metal-to-metal fits between end shields and frame.

EXTRA PROTECTION . . . AGAINST ELECTRICAL BREAKDOWN!

Motor windings of Formex* wire, together with improved insulating materials, to reduce the chances of electrical failure. Large, free-flowing air passages to dissipate heat quickly.



EXTRA PROTECTION . . . AGAINST OPERATING WEAR AND TEAR!

Improved bearing design to retain lubricant, keep out dirt. Long, close-running fits to keep foreign matter from entering motor along shaft.

NOW ... AN EVEN TOUGHER TRI-CLAD! Newest addition to the Tri-Clad motor family is the Tri-Clad totally enclosed, fan-cooled motor. It meets the Federal Code requirements for dust-tight tipple motors, with these extra protection features:

 A cast-iron, double-wall frame which completely encloses and protects the windings and punchings

1

- A non-sbrinking compound around motor leads which protects motor interior from dust and moisture
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter

Make it an "ALL G-E"

CO-ORDINATED ELECTRIC DRIVE!

Preparation plant operators who specify General Electric coordinated electric drives avoid the endless details involved in ordering and securing delivery of all the many components in a modern electric drive. And they know they're getting a soundly engineered system to meet a specific set of conditions.

A co-ordinated General Electric "package" drive includes G-E "packaged" unit substations, G-E Cabinetrol for low-voltage motor control, G-E Limitamp for high-voltage motor control, Tri-Clad motors for drives where protection is important, G-E cable, and G-E push-button installations for centralized control. Why not call in a General Electric coal mining specialist to discuss your electric drive problems soon? Apparatus Dept., General Electric Company, Schenectady 5, N. Y.



Motors and Controls

FOR TH

COAL MINING INDUSTRY

GENERAL ELECTRIC



[Page 8]



shorter overall length

- lighter weight

Here is another outstanding CP development—the ROTORdrifter, with its built-in rotary feed motor.

CP drifters have long been recognized for their exceptional drilling speed, powerful rotation, low air consumption and minimum maintenance.

To these advantages Chicago Pneumatic now adds a new and more efficient feed, actuated by a vane type, rotary motor, built into the drill. With this motor the necessity for a second air hose is eliminated.

The use of this motor of simple design, with a spur gear drive to the feed nut (the feed screw remains stationary), permits the construction of a drill of—Shorter overall length . . . Lighter weight . . . Exceptional balance . . . Minimum number of working parts . . . Low upkeep.

CP-50N ROTORdrifter -

3" cylinder bore

CP-60N ROTORdrifter-

31/2" cylinder bore

Consult your nearest CP Branch Office for full particulars.







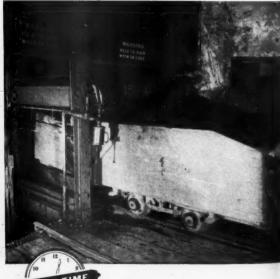
PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



LOADING -4-ton cars equipped with Automatic Couplers move under the loading boom and back into adjacent chutes quickly and easily. All unnecessary time in coupling and uncoupling is eliminated.

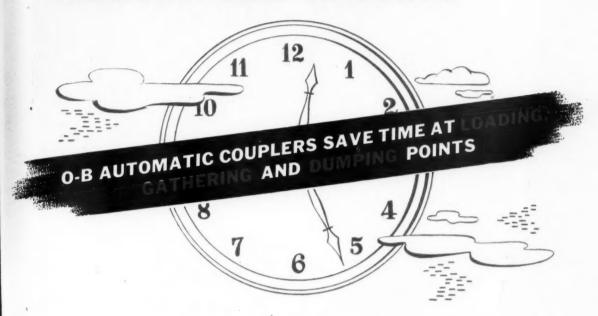


GATHERING -The motor moves in, automatically couples to a string of loaded cars and whisks them out to the main haul. Cars couple automatically as they come together—no need to go between the cars to manipulate the hitchings.



DUMPING—As the loaded car enters the hoist, it bumps off the empty which then couples into a trip without manual attention.

...SPEEDS COAL HANDLING WITH MODERN RAIL HAULAGE



To bring coal from the vast interiors of its Leisenring Mines, the H. C. Frick Coke Company, subsidiary of the United States Steel Corporation, uses modern rail haulage, a system embracing miles upon miles of underground track and more than 1800 all-steel, end-dump cars. To add still greater efficiency to this system, each of the 1800 cars is equipped with O-B Automatic Couplers

for faster car shunting, easier handling and increased personal safety.

Automatic Couplers can bring the same benefits to your haulage system. If you are contemplating the purchase of new mine cars, make it a point to investigate the O-B Automatic Coupler—the coupler designed specifically to meet mine operating conditions. Write today for engineering details.

Ohio Brass

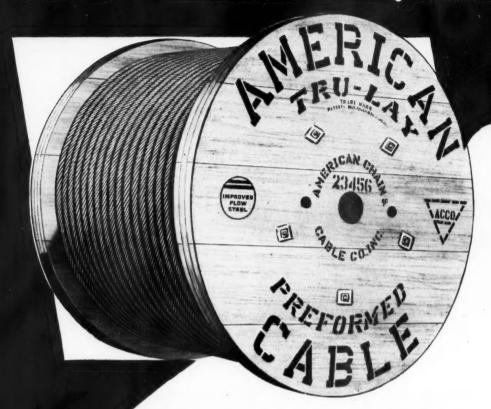
MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



[Page 11]

TRU-LAY Preformed



SLUSHER SERVICE

Wire rope takes a real beating in slusher service. Miners know what happens when the rope is cranky . . . and the dangers when some ropes whip and wear prematurely. These dangers can be reduced with TRU-LAY. • You might call it "gilt-edge" wire rope . . . this TRU-LAY. It cuts clean without seizing. It takes bending longer over small sheaves. Its flexibility permits use of constructions that last longer under severe abrasion of buckets, sharp ore and rocks. And when wires do wear through, they don't turn into barbs that will slice a fellow's hand right through his glove. These are the advantages gained by Preformed Improved Plow Steel. Ask for TRU-LAY Preformed Improved Plow Steel.



AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE



B AKER Cable Bulldozers are rapidly becoming the favorite among experienced earth-movers from coast to coast. It's the same story everywhere—BAKER—in the mines, quarries, oil fields, forests and tough construction jobs. It's Baker because of the many superior features and advantages that pay off in higher daily yardage, greater versatility and utility, more work hours per shift and reduced maintenance costs.

Now when you have the privilege of selecting equipment—it will pay you to get the facts on Baker Bulldozers and Gradebuilders, cable or hydraulic control. Write for literature or see your Baker-Allis-Chalmers distributor.

BAKER MFG. CO., SPRINGFIELD, ILL.

EASIER OPERATION - Less effort required to operate P.C.U. Brake

MOLDBOARD THEY - Bulldozer and Gradebuilder blades can be tilted in 4 positions

QUICKLY CONVERTIBLE — Bulldozer or Gradebuilder employ same superstructure, control unit and trunions

REDUCED CABLE WEAR — "Straight Line" Reeving Large diameter sheaves and drums

HEAVY DUTY CONSTRUCTION - Simple in design, extra heavy construction, all mechanism readily accessible



"STRAIGHT THROUGH" ASSEMBLY LINE - ALLIS-CHALMERS TO BAKER TO YOU. The modern Baker plant with its complately easily per line with its complately easily per line.

built to cut

| / | Locomotive Component | How It's Built | Its Advantages |
|---|----------------------|--|---|
| | FRAME | End frame is cut from rolled steel plate and welded to heavy steel side frames. | Frame stays aligned and rigid. No periodic tightening is necessary. |
| | SPRINGS | Strong coil springs rest on drop center equalizer bars which distribute the weight to the tops of journal boxes. | Wheel loading is equalized. Locomotive rides easily with less wear and tear on trackage. |
| | JOURNALS | Sealed journals, fitted with tapered roller bearings, are greased through pressure gun fittings. | Lubrication is simple. Bearing seals retain lubricant and keep out dirt. |
| | MOTORS | Motor windings use rectangular conductors to save space. Coils are coated with Glyptal lacquer. | Power losses and heating are decreased. Windings are not affected by moisture, oil, and weak acids. |
| | GEARS GEARS | Gears and pinions are one-piece steel forgings treated to give hard- wearing surfaces and a tough core. | Less gear wear minimizes main- tenance and extends service life. |
| | BRAKE | Brake rigging consists of lever type hand brake with equalizing lever to brake shoes. | Powerful braking action can be applied and released quickly. Time is saved in maneuvering. |
| / | CONTROLS | Controller is progressive series- parallel type. | Conserves battery power by providing economical, low-speed running connections. |

hauling costs!



STORAGE-BATTERY MINE LOCOMOTIVE

n mines where ore transportation requirements can be net with a relatively small number of hauling units, General Electric storage-battery locomotives quickly may for themselves in low-cost haulage. They need no arge capital outlay for power-carrying equipment.

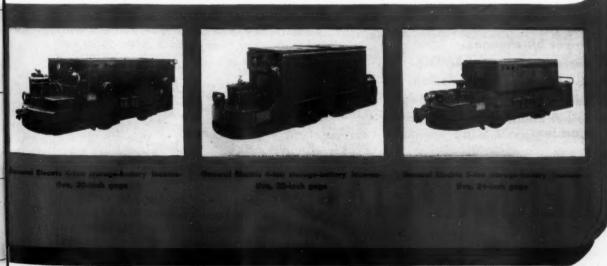
Beyond this, there's the extra strength and staying ower built into General Electric mine locomotives. hey're built to absorb the hard shocks and abuse of ough mine service. Consequently, they spend fewer ours in the repair shop and more time on the tracks auling capacity loads.

ıg

eed

What Are Your Locomotive Requirements? Forty-five years of locomotive-building experience have taught General Electric how to build locomotives with all the advantages listed on the opposite page. And General Electric makes all types—cable reel, trolley, and storage-battery. Before you decide on your next hauling units, consult a General Electric locomotive specialist. Tell him what you are looking for. More than likely, he'll be able to recommend a General Electric mine locomotive that meets your requirements exactly. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.







A time and cost survey on Kennametal bits shows that in 9 out of 10 coal seams Kennametal bits reduce preparation time per place and lower the bit cost per ton for both cutting and drilling.

The five big advantages Kennametal bits bring you according to the findings of the survey are:

- 1. Fewer bit changes.
- 2. Faster cutting and drilling.
- 3. Lower power consumption.
- 4. Less sharpening and haulage.
- Lower maintenance cost on the machine.

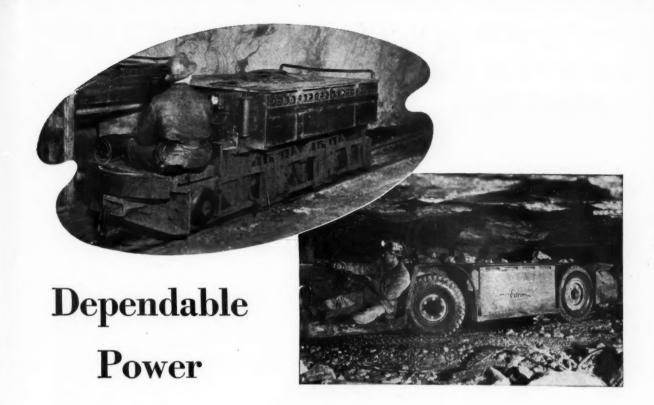
Kennametal has a hard, wear-resistant cutting edge plus the ability to take the shock of hitting hard material in the seam. It lasts far longer than ordinary steel—frequently outwearing it 100 times and more. Its ability to stay sharp reduces preparation time per place 25% to 40%, and the amount of time spent changing ordinary bits sometimes costs five times as much as the initial cost of Kennametal.



MINING DIVISION
KENNAMETAL INC., LATROBE, PA., U. S. A.



Send for our new booklet 47-M1 on "Speedier Face Preparation and Less Bit Cost Per Ton." This booklet gives performance facts and has coverage over 15 different coal seams and 15 types of rock.



for Mine Locomotive or Shuttle-car~

In Mine Locomotives and Shuttle Cars EDISON Nickel-Iron-Alkaline Batteries Give You These Important Advantages

- They are durable mechanically; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are foolproof electrically; are not injured by short-circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- They can be charged rapidly; do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They withstand temperature extremes; are free from freezing hazard; are easily ventilated for rapid cooling.
- They can stand idle indefinitely without injury, without attention, and without expense.
- They are simple and easy to maintain.

WHEN IT COMES to standing up in mine haulage service—on locomotives or shuttle cars—EDISON Nickel-Iron-Alkaline Batteries have no equal for rugged strength and dependability. As a result, they give the closest approach to failure-free, uninterrupted haulage power it is possible to obtain, and give longer service life than other types of batteries. The reasons are few and simple: steel cell construction that withstands rough, hard usage; an alkaline electrolyte that is a preservative of steel; and an electrochemical principle of operation that is free from self-destructive reactions. Because they stay on the job and out of the repair shop, nickel-iron-alkaline batteries help cut haulage costs. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Ltd., Montreal and Toronto.



EDISON

Nickel • Iron • Alkaline STORAGE BATTERIES



FOR MORE MINES

than any other kind

The largest selling bits for use with mechanical coal cutting machines are Bowdil Bits. Such popularity is deserved by performance, long life and low cost operation in a growing list of mines throughout the world.

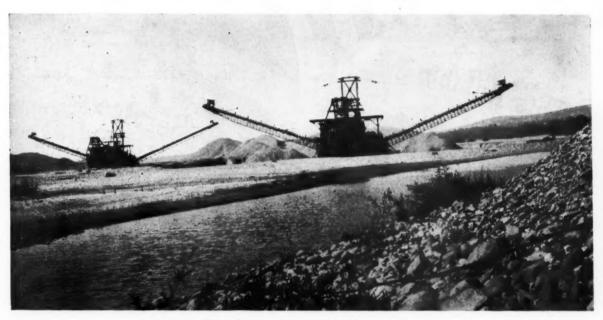
Made of special alloy steel and heat treated by the most modern methods to hardnesses best suited to your cutting conditions, Bowdil Bits are available in special shapes, cutting face contours and clearance angles to fit your needs.

A nearby Bowdil Service Man or Representative will be pleased to give you further information. Write for our latest bulletins on Bowdil Mining products.

BOWDIL-

RECLAMATION WORK ON CALIFORNIA RIVERS

-by Gold Dredges



Yuba double stacker dredges at Hammonton, California—digging flood control channels for U. S. Army Engineers during gold dredging operations.



Large Yuba dredges using 18 cu. ft. buckets for deep dredging were used more than twenty years ago in co-

operation with United States Engineers in developing channels for flood control on the Yuba River. Two such Yubas equipped with double stackers operating twelve miles above Marysville, California, discharged tailings at right angles to the course of the dredges. Tailings were piled in parallel rows about 500 feet apart and two diversion channels about five miles long each were constructed as gold dredging progressed. Beneficial results were soon noticed in all downstream communities, especially in Marysville where the Yuba River, during flood stages, actually subsides while it is still rising in the channels built by the dredges further upstream.

This is only one instance where dredges in California during gold mining operations have been used in cooperation with reclamation authorities. Stream beds have been straightened and deepened; levees have been built and other work done to prevent damage to orchards and other farm lands. Such work is being done at present by gold dredges on the Feather River below Oroville. varied experience with dredge design may be of help to you, especially if your dredging property is unusually deep. A dredge for placer mining, and displacing from 3,000 to 4.000 tons, is not usual but several Yubas of this size have worked in California for many years. By drawing upon the experience such as is available within the Yuba organization one can be designed and built with reasonable assurance that it will function satisfactorily. Consult Yuba and make use of its expert knowledge if your plans for the future include placer dredging.

YUBA MANUFACTURING CO.

351 California St., San Francisco, California, U. S. A.
AGENTS SIME, DARRY & CO., LTD. - SINGAPORE, KUALA LUMPUR, PINANG.
SHAW DARRY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, LC.3.



 It's the muster of Mack branches and dealers -707 strong--a far-reaching network we've set up throughout the United States and Canada for sales and service on Mack trucks.

It includes 67 Mack direct-factory branches strategically located in main industrial and trading areas. Each is manned by factory-trained experts who are constantly kept informed of improved service methods. Each is equipped with specialized Mack service tools that assure timesaving, money-saving precision work. And each is stocked with genuine high-quality Mack parts-parts that fit better and wear longer.

In more than 600 other communities Mack dealers-selected and responsible leaders in their field--also stand ready to give fast, on-the-spot service to Mack owners.

This means that no matter where your Macks may roll-there's always a source of authorized service and factory-made parts within easy reach.

It didn't just happen that way. We planned this service network as carefully as we plan every nut and bolt in a Mack truck.

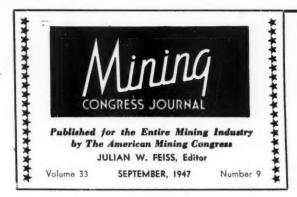
Macks are built to need less service than other trucks. Our organization is built to make that service easy to get.



since 1900, America's hardest-working truck

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.

Trucks for every purpose



NEW QUARTERS

THE American Mining Congress has been located in the Munsey Building for more than 30 years. In 1935, in order to provide for more adequate office space, the recent third floor quarters were chosen. Since that date Room 309 has been the Washington center of the domestic mining industry.

On September 12, the American Mining Congress moved to the 11th floor of the newly-constructed Ring Building, facing Connecticut Avenue at 18th and M Streets, Northwest. Located but a block above the Mayflower Hotel to the south of DuPont Circle, the Ring Building offers modern office facilities, a better floor plan, and air conditioning.

There are times when a new suit or a new hat, although merely external forms of adornment, serve a definite purpose. In the vernacular of the avenue, the wearer derives a "lift" from the improved appearance. This phenomenon is especially evident following a hair cut. The staff of the American Mining Congress and Mining Congress Journal, despite the odor of fresh paint and the turmoil incident to the move, is enjoying the "lift"—and is prepared to render an increasing measure of service to meet today's needs of the mining industry in the Nation's Capital.

DDT NEEDED

WITHIN the last month there has come to the attention of the mining industry a 15-page leaflet entitled, "Report to President Philip Murray, Congress of Industrial Organizations." The publication is dated May 16-17, 1947, and was written by a committee appointed to investigate the breach within the ranks of the International Union of Mine, Mill and Smelter Workers, a CIO affiliate.

To the many who have assumed that accusations of Communism in the CIO were deliberate attempts on the part of outsiders to discredit the union, this report must be a revelation. Maurice E. Travis, the

president of the Mine, Mill and Smelter Workers Union, now stands accused of acting under the guidance and instructions of the Communist Party. Published are copies of a letter to Travis from the late Phil Wilkes, organizer for the Communist Party. and a letter from Wilkes to Henry Huff, executive secretary, North West District, Communist Party. These letters prove conclusively that in early 1946 Travis had been continuously dealing with representatives of the Communist Party in shaping union policy, and even more damning, that union representatives were soliciting Communist Party membership within their own organization and from outsiders. The report asserts that photostatic copies of the original letters are in the hands of the CIO investigating committee.

Further confirming this evidence, Charles Moyer, who was elected secretary-treasurer of the International Union in September, 1946, testified before the CIO investigating committee. Moyer, who has since resigned from office, stated that he was unable to continue as secretary-treasurer of an organization whose officers had requested him to issue untrue statements; furthermore, he accused the present officers of the International Union of loyalty to an outside group having no connection with the trade union movement—the Communist Party.

Although many individuals connected with the mining industry have known of Communist infiltration within the ranks of the Mine, Mill and Smelter Workers Union, this is the first time that leaders of the CIO, the parent body, have indicated how extensive this penetration has become. The peculiar blindness on the part of labor leaders to this obvious boring from within during recent years is difficult to comprehend. A large proportion of their following have lost confidence in union leadership, and union prestige has declined in the eyes of the public.

President Philip Murray and his committee composed of: Jacob S. Potofsky, president of the Amalgamated Clothing Workers; Van A. Bittner, vice president of the United Steelworkers; and L. S. Buckmaster, president of the United Rubber Workers, are to be commended for their courage and for the public circulation of this report. Although their position would have been stronger had they taken a stand against these Communist elements prior to the passage of the Taft-Hartley law, this act on their part should help clear the air and restore a measure of self-respect to those participating in labor union activities. Their next step is to clean house and we hope that President Murray and his staff have an ample supply of DDT.

The Centrifugal Ball-Mill Classifier

By C. ERB WUENSCH

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The Search for a Universal Grinding and Classifying Machine Continues.

The Author, Well Known for His Pioneer Work on Sink-Float Concentration, Summarizes Experiments with a Vertical Ball Mill Which Combines Grinding with Partial Classification

IN 1930 the writer developed and patented a vertical ball mill which combined grinding and partial classification. In this mill of roughly parabolic cross-section (similar to the one about to be described) the bowl revolved at high speed and fixed, suspended ploughs projected down into the mill and deflected the balls and material to be ground. The highspeed rotation (300 to 600 r.p.m.) set up considerable centrifugal force, which greatly increased the grinding capacity of this mill as compared to the conventional ball mill. Furthermore, the centrifugal action caused a classification of the material.

The finest ground particles remained in the center of the mill and were withdrawn, through a central vertical pipe, discharging at the bottom of the mill. This product contained a much smaller proportion of over-grind product as compared to that from a conventional ball mill. The finer sands and some of the balls lined the mill and the coarser particles, due to their greater interstitial resistance (in spite of their greater centrifugal force), arranged themselves nearer the center and assisted in the grinding. Though the mill was very efficient, it had a high starting torque and frequently balls would wedge between the ploughs and the revolving bowl and stop the mill. In addition to this, it was very hard on the bearings due to the unbalanced load and the tremendous pressures developed. It was also difficult to control the rate of feed to the mill. No controls were then developed. A 15-in. diameter mill was built and later one of 48-in. diameter, before the work was abandoned.

The possibilities of this type of high-speed mill, combining classification with grinding, were so impressive that subsequent attempts were made to develop a mill which would correct the defects in this prototype. The present mill may solve these difficulties.

A Mill of Unusual Design

Reference to Fig. 1 will facilitate the description: (1) is a parabolicshaped bowl (cast in two sections); (2) is the rotor and (2a) a circular retaining ring, which holds one layer of balls (2c) in the rotor as shown; (2b) are the impeller blades on the underneath side of the rotor. This layer of balls projecting above the ring (2c) forms a sufficiently rough surface to facilitate imparting the centrifugal force to the rest of the balls and ore particles, and at the same time it minimizes the starting torque and does not disturb the quiescent classification zone in the upper part of the mill. The rotor is driven from underneath the mill, as will be described.

A replaceable filler ring (3) keeps the balls from resting on the circular retaining ring (2a), thereby minimizing the starting torque and wear on the ring.

Ploughs indicated by (4), of which there are three or more in number, depending on the size of the mill, are fastened to the inside of the bowl. Were it not for these ploughs the centrifugally flung balls and ore would whirl around the mill, wear out the shell and prevent proper grinding action. The ploughs serve two functions: First, they retard this whirling action and abrasion causes some of the balls and material to form a very slow-moving lining in the mill; secondly, they set up a back pressure which greatly facilitates the grinding action. These ploughs are set at a very slight angle from the vertical to impart an upward whirl to the charge. This further facilitates a proper cascading action as well as improves the classification and grinding action. There is surprisingly little wear on the edge of the ploughs as they trap a verticle layer of the balls and ore. This layer, in contact with the ploughs, is practically stationary. Each succeeding layer increases in velocity toward the center, until at the center of the rotor there is a downward vortex, which becomes a quiescent classifying bowl before the top of the mill is reached. The balls and ore (12) classify themselves as indicated; the smaller balls and ore lining the mill and increasing in size toward the center. The slimes remain in the central part of the mill and pass upward over the overflow weir (6).

An Ingenious Hydraulic Control

A funnel-shaped feed chute (5), with pipe (5A), extends well into the This funnel-shaped member has an additional function. It is vertically adjustable above the peripheral classifying overflow weir (6), by means of adjusting bolts (not shown). When the funnel (5) is lowered the width (area) of the classifying zone (7) is reduced. Therefore, for a given amount of water introduced at (8), underneath the rotor (2), the upward velocity is increased. When the funnel (5) is raised, the zone (area 7) is increased. Therefore for the same volume of water, the upward overflow velocity is reduced. This provides a refinement to assist in the classifica-

The impellers on the underside of the rotor facilitate the introduction and distribution of the water, as well as the classification, and minimizes abrasion on the rim of the rotor. The balls take all the wear.

Gauges Control Water Flow

Notice density gauges (9) and (10); gauge (9) is placed near the upward part of the bowl beneath the weir overflow. This automatically controls the amount of water introduced at (8) through a solenoid operated valve (not shown) and controls the density of the product discharged from the mill. Density gauge (10) is placed at a greater depth than (9) and automatically controls the amount of ore fed into the mill. Thus by virtue of these two control devices, the mill is always operated at capacity and the weir overflow product maintained at a constant density. No additional external classification is

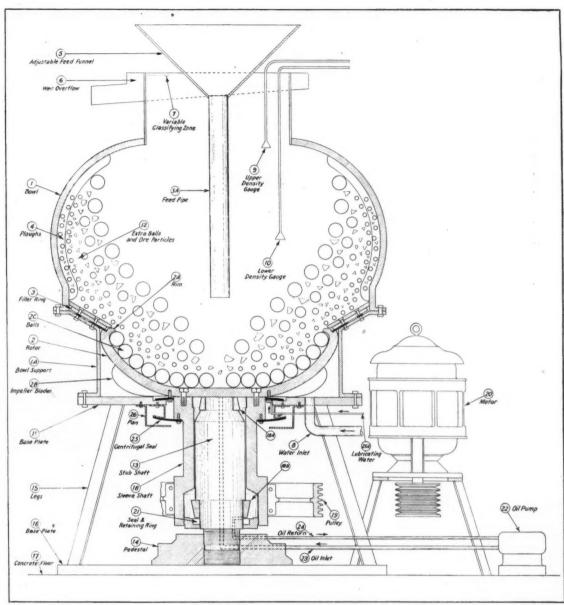


Fig. I. Diagrammatic sketch of Wuensch Ball-Mill Classifier

necessary, except perhaps some screening in certain instances, as will be explained later.

From this description it is evident that the ball mill combines simultaneous classification with grinding, thereby minimizing overgrinding with a resultant important saving in power, and also produces a superior product for the subsequent steps in the treatment. Additional balls (12) are indicated. Only a fraction of the ball load (used in the conventional ball mill) is required for grinding a given tonnage.

A stub shaft (13) is screwed into base pedestal (14). This, in addition

to supporting legs (15), is mounted on a light base plate (16) and concrete foundation (17). Hollow sleeve shaft (18) rotates around the vertical stub shaft (13) with upper thrust bearing (18A) and lower radial bearing (18B). Rotor (2) is bolted to sleeve shaft (18) as shown. A pulley (19) is also fastened to sleeve shaft (18) as shown and driven by vertical motor (20). An oil seal and adjustable retaining flange (21) is screwed into the lower part of sleeve shaft (18).

Oil for lubrication is provided by oil pump (22), through the tubing and upward through the center of conduit (23) of the stub shaft; thence to bearing (18A) and down to bearing (18B) and thence back to the pump through return conduit (24).

How Leakage Is Avoided

No stuffing box is required to prevent leakage through the bottom of the mill. A special centrifugal seal (25) is provided. This is a modified type of one used successfully in a centrifugal pump that I have developed. The upper and lower rubber flaps of the centrifugal seal are lubricated by a trickle of water through tube (25A). The upper flap acts as a check valve when the mill is shut

down. Pan (26) catches any lubricating water that is slung by the lower flap of centrifugal seal (25), as it rotates with the rotor shaft.

Advantages Over 1930 Model

Before giving a summary of the performance of the mill, it might be well to emphasize a few points. This new type of mill retains the attractive effective grinding principles of the 1930 prototype. The classification is comparable to that obtained by external classifiers in the conventional ball-mill circuit. Bearing pressures are tremendously reduced and any serious unbalanced loading is obviated by the dampening action of the circulating load on the rotor. The automatic controls are vital improvements and without them the mill could not be controlled. They are the result of much work that has been done since 1930 in the development of such devices for controlling the density of heavy-media and pulps.

It is obvious why a high-speed mill of this type should have a higher grinding capacity and efficiency than the conventional horizontal ball mill. In the latter peripheral speeds must be kept under 400-600 ft. per minute or there will be no grinding, due to the centrifugal force holding the balls stationary against the shell of the mill. In this mill peripheral speeds may be several thousand feet per minute. Obviously with the increased speed the balls are grinding under a tremendously increased centrifugal pressure. The ploughs cause a considerable back-pressure on the centrifugally whirling balls and ore, and every ball and particle in the mill (except the layer held behind the ploughs) is traveling at a different speed and grinding under the centrifugal pressure.

In larger mills much of the grinding is done by the larger particles of ore and relatively few balls are required. There is practically no liner wear.

The balls in the rotor take most of the wear. Experiments should be made on using rubber-covered balls of balls of superior hardness to the rest of the balls in the mill. To replace them, the charge is dumped through a trapdoor (not shown) and fresh balls are placed in the rotor before returning the charge.

A Comparative Test Is Made

The accompanying photograph, Fig. 2, shows the arrangement of the two machines. They both are of equal volume. Twenty tests were made on minus ¼-in. quartz and limestone in the ball-mill classifier and 10 tests in the conventional ball mill with various speeds, weights of balls, pulp densities, etc. All products were saved, weighed and a sample cut, and screen analyses made.

Numerous wattmeter readings were

taken during the tests. The grinding rates were determined by calculating the weight of the —48 mesh, —100 mesh, —200 mesh, and —325 mesh, in the ground product after deducting the weights of the same sized products in the feed. The net weights divided by the length of time taken to produce them gave the rate of grind in pounds per hour.

The energy efficiency calculations were based on the pounds per hour produced, multiplied by the power input in terms of kilowatts. Thus the kilowatt-hours per ton were calculated for each test and for each size of product.

The conventional mill was run at 62 to 80 r.p.m. and the ball mill-classifier at 120 to 340 r.p.m.

Considerable technical literature is available on the performance of small-size laboratory conventional ball mills. The data we obtained very closely checked such results.

The Effect of Higher Speeds

Increasing the speed of the ballmill classifier seemed to increase the power consumption more than an increase in ball load or feed load. Increasing the speed also seemed to increase the grinding rate and improved the classification. This small mill (with an overhead drive) was not sturdily enough built to increase the speed over 340 r.p.m., to ascertain the most effective operating speeds. Also, the overflow weir was too small (primarily due to interference from the overhead drive shaft) to permit using the density controls. Consequently, the classification was somewhat erratic. At times the mill was overfed; when properly controlled the classification was very satisfactory. In this connection it was very interesting to observe that when grinding to 90 per cent minus 100 mesh that the conventional mill produced from

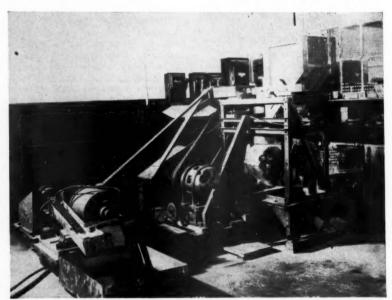


Fig. 2. A comparative test was made with a 12-in, ball-mill classifier in competition with a 12 x 12-in, conventional ball mill in closed circuit with a spiral classifier

When the ball-mill classifier was operated with the same ball load as the conventional mill, it ground up to seven times as fast with 12 per cent less power. This is noteworthy because it was utilizing less than 50 per cent of its full ball load; the bulk of the balls were held up in the rotor and lining of the mill. Increasing the speed and ball load up to a maximum of 51.2 kgs. and 340 r.p.m., the ball mill-classifier ground as much as 18 times as fast as the conventional mill with up to 50 per cent less power per pound ground. (With the conventional mill only 20.0 kgs. of balls could be used. Above this amount too many balls were discharged from the

70 to 80 per cent of minus 325 mesh product, whereas in the ball-mill classifier only from 35 to 50 per cent was minus 325 mesh.

In the best grinding rate test of each mill using quartz feed we have the following comparison:

| | Grinding rate, Lbs./Hr. | |
|------------------|-------------------------|-------------------------|
| Product mesh | Conventional mill | Ball-mill classifier |
| -48 -100 | $8.11 \\ 8.76$ | 153.0 141.6 |
| 200 | 8.22 | 91.2 |
| —325 Kws./Ton | $6.50 \\ 51.5$ | 65.5 35.1 |

Note: In this test the ball-mill classifier used 31 per cent less power. In other tests it used up to 50 per cent less.

in all, about 5,000 lbs. were ground in the ball mill-classifier tests. On account of the varying ball load it was not possible to determine the ball wear. In addition, between some of the runs the remaining ore in the mill was "ground out." The ball wear did not appear excessive even on the balls in the rotor and the interior of the mill showed no noticeable wear.

The results of the tests were so encouraging that it was decided to build a 24-in. diameter mill with an underhand drive so that the effects of higher speeds could be investigated and also with ample space in the weir overflow classifier to permit the use of the density controls.

Studies with a Fish Bowl

Before designing the 24-in. mill, considerable time was spent in studying transparent models. Studies were made using a glass fish bowl with an overhead drive. A cylindrical cellu-loid model was then built with a variable speed underhand drive, ploughs, and a weir overflow using small marbles and camphor balls. In this model it appeared that the active balls would form a parabolic crosssection when in operation, the balance lining the mill. The effect of the ploughs was studied in different positions. As a result of these experiments it was decided that it would not be necessary to make castings for the bowl but that it could be made from rolled-steel plate. Subsequent experience showed that this was a serious mistake.

Several pounds of soft hematite ore were actually ground in this celluloid mill without even scouring the celluloid, due to the ploughs causing the ore particles and smaller marbles to form a lining in the mill.

Experiments with the 24-in. Mill

Reference to Figs. 3 and 4 will show the 24-in. cylindrical ball mill-classifier; Fig. 3 shows the complete mill, whereas Fig. 4 shows the underhand drive assembly.

Circumstances prevented the complete testing of this unit with different speeds and ball loads. Consequently the data was not assembled in the same form as that covered in the 12-in. unit. A mistake was made in deviating from the shape of the 12-in. mill in order to simplify the manufacture of this larger unit.

facture of this larger unit.

At first the rotor was made flat and the sides of the mill cylindrical. Difficulties were experienced in keeping the balls in the flat rotor, so they were finally imbedded in molten lead so as to get some grinding data. This showed that the mill ground at the rate of 1½ tons per hour, grinding minus ¾-in. limestone and operating at 312 r.p.m., with a ball load of 620 lbs. Under these conditions the power

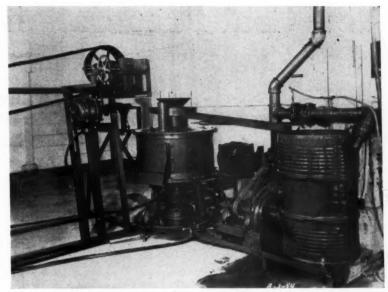


Fig. 3. The 24-in. experimental model used an underhand drive and the shape of the bowl was changed

consumption was 13.3 kwh. per ton. The rotor was then cupped so that the outer edge was about $2\frac{1}{2}$ in. higher than the center.

We then repeated the tests, but unfortunately in ordering some more limestone, we received minus %-in. material instead of the minus ¾-in. material, and on this basis we ground up to 40 tons per day with a power consumption of 17 kwh. per ton, with a ball load of 750 lbs. at 324 r.p.m. We then speeded up the mill and made tests on some more limestone, and this time we received minus 2½-in. material instead of minus ¾-in., which we ordered. The amazing thing was

of 30 tons per day of this coarse material, with a power consumption of 16.3 kwh., with a ball load of 850 lbs., grinding everything to minus 100 mesh.

On 3-in. quartz grinding was done at the rate of 23 tons per day, with

that the machine ground at the rate

On 3-in. quartz grinding was done at the rate of 23 tons per day, with consumption of 23.3 kw. per ton. Analyzing all of the results, it looks as though this mill will grind as much as a 4-ft. x 5-ft. conventional mill, consuming about 40 per cent less power, and utilizing a ball load of about 850 lbs., compared to 7,500 lbs. of balls in the conventional mill. On top of this, the product of this mill will contain less than 50 per cent minus 325 mesh material, as compared to 70 to 80 per cent minus 325 mesh for the conventional mill, when grinding to 100 mesh.

Can Ball Wear Be Reduced?

The ball wear was 2.96 lbs. per ton for the last tests, with a slightly dished rotor, as compared to between 4 and 5 lbs. for the flat rotor. It is obvious that the rotor should have been dished more to approximate the shape of the small original 12-in, unit. This can be done relatively simply with the present mill. In order to modify the cylindrical walls of the 24-in. mill, false liners could be installed so as to approximate the shape of the small mill. It is obvious that when these changes are made, the ball wear should be much less and, perhaps, more grinding will be accomplished with less power, because in the present mill it is like slinging a ball against a vertical wall and expecting it to climb; it does so, but at the ex-

(Continued on page 49)



Fig. 4. The drive at the base of the 24-in. centrifugal ball mill classifier

New Coal Preparation Plant

A NEW preparation plant with a capacity of 750 tons of raw coal per hour is to be erected at Price, Ky., in the southeastern part of the state—on the Beaver Creek Branch of the C. & O. R. R., 8 miles north of their present operation at Wheelwright, according to a recent announcement by Inland Steel Company. They state that it is planned to be one of "the most complete coal cleaning plants yet designed or built," and will be named after E. R. (Jack) Price, General Superintendent of Inland's coal properties, who is widely known throughout the coal industry.

This extension of Inland's operations in the area has just been approved as a part of the expansion program that has been under way for some time and during 1946, the company strengthened its raw material reserve position by acquiring a very large additional acreage of high grade coking coal adjacent to its Wheelwright properties. All the coal in the approximately 30,000 acres owned and leased by Inland will be beneficiated through the proposed preparation plant as well as any coal that might be purchased from other mines in the area.

Cleaning Plant Design

Engineering and construction will be by Link-Belt Company; engineering has already begun and approximately 28 months will be required for complete construction with 26 months estimated before initial operations. The new plant will be reached from the present mine workings by a tunnel 5 miles long through the coal seam. This is now being driven from three Modern in Every Detail, This Large Capacity Operation Is Being Designed to Mine and Prepare a High-Grade Metallurgical Fuel for the Inland Steel Company



E. R. PRICE For whom the new plant is named

places—from the present mine, from the new portal at Price, and from an outcrop opening between these two points.

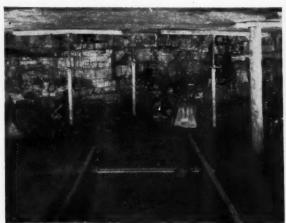
The new plans propose to completely mechanize the underground operations which are now about 70 per cent mechanized, and will eliminate all hand picking at the face. This is the present practice and the result is a coal with non-uniform ash. The new cleaning plant will wash and dry all

sizes of coal of less than 5 in.; the plus 5 in. coal will be hand picked and go direct through a loading boom to the railroad cars. All minus 5 in. coal will be blended in a 1,000 ton bin and then separated into plus and minus 3/9-in. The plus %-in. sizes will be cleaned in air-pulsated washboxes and passed over dewatering and classifying screens; the minus 3/9-in. product will be fed uniformly over 18 Deister concentrating tables and dried in five Bird filters. There will be provision for re-crushing all sizes over 2 in. and mixing with the smaller sizes. The end result will be to reduce the ash and will make that ash uniform in the coal going into coke for steel making at Inland's Indiana Harbor Plant.

Mining Methods

The seam mined is the Elkhorn No. 3 which in this area is quite irregular in height, ranging from 30 in. to 50 in. and has rather difficult mining conditions—a drawslate top which requires timbering both in rooms and entries, and with numerous local rolls. As the main haulage grades are kept down to a maximum of 3 per cent, quite a little grading is required either in taking top or bottom.

The mine is now about 70 per cent mechanized but is planned for com-





Safety and good housekeeping are maintained underground

plete mechanical operation. Because of the variable seam conditions, no one system of mechanization or type of equipment can be applied throughout the area and at present there is hand loading into mine cars, hand loading onto chain and shaker conveyors, mechanical loading with Joy machines into mine cars and shuttle cars, and Myers-Whaley mechanical loaders for rock work. On the main haulage, 60 lb. rail is laid on treated ties, the mine cars are steel construction rotary dump type of 2.75 ton capacity with mechanical loading.

Mining is by the room pillar system, but because of the varying seam conditions and also the varying cover—which is as high as 1,000 ft. in places—the pillar recovery methods vary. In some cases, wide pillars are left between rooms and mined out; in other cases, the rooms are driven with narrow pillars that are left in place. However, a satisfactory percentage of extraction is made.

A Modern Town

Wheelwright has been known for some years as being one of the most modern coal mining towns in the country with its paved streets, attractively designed stores, offices and club house and with miners' dwellings having such conveniences as electricity, water, bathrooms. A complete sewage system and incinerator makes the sanitary arrangements of this town thoroughly up-to-date.

In addition to the utilitarian features, there are adequate provisions for amusement and relaxation-a picture show, club rooms, dancehall, swimming pool and a nine-hole golf course that deserves special mention. Located in the heart of the Cumberland Mountains, there are no large areas of level ground or even rolling ground available here; consequently, the golf course had to be built. This was done in one of the "hollows," laying a 4 ft. concrete pipe in the stream bed and with a bulldozer, taking earth off the side of the hills and filling in over the stream bed to make the fairway. Nature has provided plenty of "rough," and as a further attraction, it is probably the only golf course in the country with a mine powder magazine for a hazard. Golf has become quite popular with the miners.

A result of the new preparation plant will be to erase almost all evidence of coal mining from Wheelwright. The present tipple will be removed and the present railroad tracks which are now in the center of town, will be taken up and a parkway, with attractive landscaping, will be built in their place. Present portals will remain open as a means of entry for workers and, as a hard surface state highway runs directly through Price, the mine workings will be easily accessible for employment to those living within the district.



This will be replaced by the new preparation plant



Wheelwright is a modern town



A golf course built for the miners

A Haulage Safety Device For Steep Grades

By L. L. MAUS

Coal-Mine Inspector Bureau of Mines Salt Lake City, Utah

FOR many years friction shoes in some form or other have been used under the wheels of mine cars to retard the speed of trips descending grades when adequate control cannot be afforded by locomotives. The removal of friction shoes from beneath mine-car wheels not only may damage the locomotives, because of the strain imposed upon them in stopping and backing trips on grades, but also exposes workmen to possible injury to the fingers and hands or even to more serious hazards.

At the Kenilworth mine of the Independent Coal & Coke Co., at Kenilworth, Utah, the common hazards involved in the removal of friction

* Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior. A method of automatically removing friction shoes from beneath the wheels of mine cars was developed at the Kenilworth Mine, Independent Coal and Coke Company, Kenilworth, Utah. A simple device designed in the company's shop has been in continuous use ever since its original installation more than eight years ago. An automatic shoe remover eliminates the hazard to workmen in removing friction shoes from beneath the wheels of cars and the necessity of stopping and backing trips, with possible damage to haulage equipment because of undue strain that may be placed upon it. The automatic shoe remover could be used at other mines, both coal and metal, with modification of the friction shoes already in use.

The device has never failed nor has it been the cause of any mishap to workmen or equipment since its original installation. The only necessary repairs to date have been those of normal maintenance and adjustment. Damage to haulage equipment, which prior to the installation of the automatic shoe remover occurred frequently, has been almost completely eliminated. It is also believed the device has been a means of avoiding many common injuries to workmen.

shoes from beneath the wheels of loaded mine cars have been eliminated by the use of specially designed friction shoes and an automatic shoe remover installed in one rail of the loaded track approach to the tipple.

The automatic shoe remover was designed by Jesse McFarland, who was the foreman in the repair shop at the mine. With possible modification of friction shoes, the automatic shoe remover probably could be used successfully at other mines throughout the country.

Main-Line Haulage Practices

Main-line trips, usually of 22 allsteel mine cars, are hauled by 15-ton trolley locomotives. The cars are of several sizes, holding 4, 5, or 6 tons of coal. The movement of trips is controlled by a clock-signal system from an underground dispatching station just inby the point where an 8,100-ft. haulage tunnel intersects the coal bed. Two tracks, one for empty trips and one for loaded trips, are provided in the tunnel, which is on a grade of 1.75 per cent in favor of the loaded trips. The double-track surface haulage between the portal of the tunnel and the tipple, about 1,500 ft. away, continues on a grade of 1.75 per cent in favor of the loaded trips to a point about 1,300 ft. from the portal, where the automatic shoe remover is in-



A simple alteration in track, as shown here (Fig. 2), is required

stalled in the loaded-track approach to the tipple. The haulage grade from the automatic shoe remover to the tipple is reduced to the extent that a trip of loaded mine cars can be controlled without difficulty by the haulage locomotive.

As a precaution against runaway trips from the tunnel reaching the tipple, a derailing switch 200 ft. outby the portal of the tunnel, controlled by an electric eye, remains in the derailing position if the speed of a trip exceeds 8 miles an hour. Automatically controlled devices installed in the track at intervals along the tunnel indicate, by red lights, in advance of a trip when a derailed car passes the points where the devices are installed.

Construction of Automatic Shoe Remover

Details of construction of the automatic shoe remover and the friction shoes in use are shown in Fig. 1. The automatic shoe remover consists of a point rail made by tapering the ball of the rail on the outside from a width of 1/2 in. at the point to full width 36 in. from the point; a wing rail, parallel to and % in. from the tapered section of the point rail, forming a flangeway for the sliding flange of a friction shoe; a shoe guide mounted upon a section of rail welded to the outside of the wing rail; and guardrails to guide the wheels of cars in the proper path of travel to assure the proper functioning of the device. A projecting metal strip, the end of which is bent downward at an angle of 90 degrees, is welded to the friction shoe to engage the shoe guide and direct the friction shoe in its path of travel along the wing rail as the mine car passes the shoe remover. installation of the automatic shoe re-

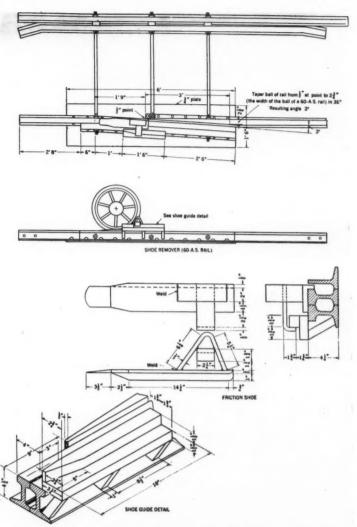


Fig. I. Construction details of the automatic remover



Fig. 3. A side view of the automatic shoe remover in place

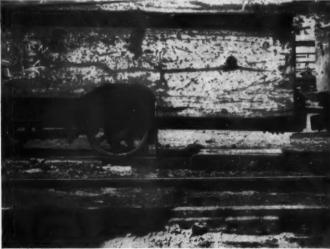


Fig. 4. The friction shoe under the car wheel approaches the shoe remover

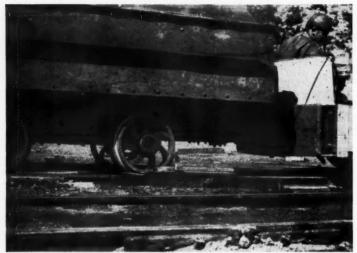


Fig. 5. The projecting metal strip of the friction shoe engages the shoe guide of the automatic remover



Fig. 6. The shoe now travels in the flangeway between the tapered point rail and the wing rail



Fig. 7. The friction shoe drops into a pit

mover in the track approach to the tipple is shown in Figs. 2 and 3.

When a friction shoe under the wheel of a mine car comes to the automatic shoe remover, the projecting metal strip of the friction shoe engages the shoe guide, and the sliding flange is directed into the flangeway between the point rail and the wing rail parallel to it. As the mine car proceeds forward, the friction shoe slides forward and outward along the wing rail and drops into a pit beside the track. The guardrail installed inside the rail opposite the shoe remover prevents the wheel flange from entering the flangeway between the point rail and wing rail.

Use of Friction Shoes

Friction shoes to retard the speed of loaded trips descending the long grade from the underground dispatching station to the tipple have been used for many years at this mine, which in recent years has produced about 4,000 tons of coal a day. The friction shoes are placed under the front wheels, on one side only, of the first four cars of a trip of loaded mine cars before it leaves the parting at the underground dispatching station.
The dispatcher checks the trip to ascertain that the friction shoes are in place as a trip passes the station on its way to descend the long grade to the tipple; if any shoes are missing, the locomotive engineer is signaled to stop the trip and have the necessary shoes put in place before proceeding.

As a trip of loaded mine cars approaches the tipple under controlled speed, it passes over the shoe remover where the friction shoes are extracted automatically without the necessity of stopping the trip. After passing the shoe remover, the trip continues under adequate control because here the grade is very slight.

Stages in the automatic extraction of a friction shoe from beneath the wheel of a loaded mine car as a trip passes over the automatic shoe remover are shown in Figs. 4 to 7. Fig. 4 shows the friction shoe beneath the wheel of a mine car as it approaches the shoe remover, before the projecting metal strip of the shoe has engaged the shoe guide. The point of the shoe guide, as shown in Fig. 1, is set 9 in. ahead of the rail point so that when the sliding flange of the shoe reaches the point it will have started to turn outward in its path of travel through the flangeway. The sliding flange of the shoe is guided in a forward and outward direction by reason of its travel in the flangeway between the tapered ball of the point rail and the wing rail parallel to it; meanwhile, the wheel of the car travels in a forward direction.

In Fig. 5 the projecting metal strip of the shoe has engaged the shoe guide, and at this point the sliding flange of the shoe has entered or is



Fig. 8. Holders for wheel shoes on locomotive cover



Fig. 9. A side view of the shoes in containers

about to enter the flangeway between the tapered ball of the point rail and the wing rail parallel to it.

In Fig. 6 the projecting metal strip of the shoe has proceeded past the shoe guide, and the shoe is guided by the sliding flange traveling in the flangeway between the tapered ball of the point rail and the wing rail parallel to it.

In Fig. 7 the car has passed over the shoe remover, and the shoe has dropped into the pit beside the track for loaded trips.

Special holders, made of half sections of metal pipe welded to the cover of a main-line haulage locomotive, for carrying shoes on locomotives hauling trips of empty cars, are shown in Figs. 8 and 9. This type of holder permits easy access to the shoes when placement under the wheels of mine cars is to be made before the trip of

loaded cars leaves the underground dispatching station.

Before the installation of the automatic shoe remover, repairs to burntout motor armatures of main-line
haulage locomotives caused by the
excessive power required in stopping
and backing trips of loaded mine cars
to remove friction shoes from beneath
the wheels of cars was a common, almost weekly, occurrence. The cost of
maintenance of main-line haulage locomotives has decreased considerably
since the automatic shoe remover was
installed because burnt-out motor
armatures have been reduced until
they are almost negligible.

Maintenance of the automatic shoe remover, which has been in constant use since it was installed, more than eight years ago, consists of minor repairs and adjustments, and at no time has it failed or been the cause of any mishap to equipment or workmen.

The installation and use of the automatic shoe remover has eliminated the necessity of stopping and backing trips of loaded mine cars to remove friction shoes, with a consequent reduction in the cost of maintenance of main-line haulage locomotives. It is believed that many injuries to the fingers and hands of workmen, and possibly injuries of a more serious nature, have been avoided during the time that the automatic shoe remover has been in use.

Acknowledgment

Grateful acknowledgment for cooperation and assistance in providing the information for this paper is made to W. F. Clarke, general manager; George B. Jackson, superintendent; and Sam Fratto, safety engineer, of the Independent Coal & Coke Co.

Bureau of Mines Reprints Glossary

In response to urgent demands for Albert H. Fay's Glossary of the Mining and Mineral Industry, the Bureau of Mines has republished the original work which has been out of print for many years.

In one comprehensive volume, the glossary presents the standard technical terms, together with the provincialisms, relating to metal mining, coal mining, quarrying, petroleum and natural gas production, metallurgy and geology, and the names of common useful minerals and rocks. The Bureau hopes to print a new and improved glossary at an early date and will welcome suggestions from industry as to changes in definitions and the inclusion of new words and phrases.

Copies of Bulletin 95, "A Glossary of the Mining and Mineral Industry," by Albert H. Fay, may be obtained for \$1.75 each from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. It is not sold by the Bureau of Mines.





Getting Set for El Paso

Program Will Stress Maintenance of Strong Mining Industry and Removal of Deterrents to New Enterprise. Prominent Leaders in Mining to Present Their Views. Unusual Entertainment Features Planned.

MINING men from throughout the United States, together with a considerable number from Mexico, will converge at El Paso, Tex., for the 1947 Metal Mining Convention of the American Mining Congress, to be held from October 27 to 29 in conjunction with the famed International Mining Days Celebration.

Feeling that a strong and progressive mining industry is of paramount importance to our domestic economy, and that deterrents to new mining enterprise must be removed to attract venture capital and insure the development of future ore reserves, the program committee has selected speakers from amongst the leaders of the mining industry-men with constructive ideas directed toward the solution of problems that confront the industry in the immediate future.

Among the important subjects to be considered are: encouragement to exploration, discovery and development or new orebodies and additional reserves by private enterprise; tax, tariff, stockpiling and public land policies of the Federal Government as they affect mining; industrial relations and labor legislation; problems of attracting and holding skilled manpower-recruiting, training and safety programs, mechanization and improved mining methods for great productivity; lower costs and reduced labor turnover; problems of the small and marginal mine operators; future prospects for the base metals and for gold and silver; potash and other nonmetallic minerals; progress in milling methods to increase available ore reserves, and new developments in underground and open pit mining operations for greater efficiency. Wednesday afternoon, the last day of the meeting, is being left open to permit special group discussions.

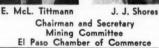
The presence of distinguished visitors from Mexico, who will describe present day mining activities and conditions "South of the Border," will be a special feature of the meeting. Eminent speakers from Government circles in Washington will also be on the program.

E. McL. Tittmann, chairman of the mining committee, El Paso Chamber of Commerce, is general chairman of arrangements for the convention. Ably assisted by J. J. Shores, secretary of the Chamber's mining committee, Mr. Tittmann and his committee are working on the entertainment features, which will include a welcoming luncheon, a "Sourdough and the annual banquet. Supper," These affairs will be informal gettogethers allowing for relaxation and enjoyment apart from the serious

business of the meeting. Tuesday evening will be open to permit visits to Juarez, in old Mexico, with an opportunity to see the night spots, bazaars and other attractions. An active Ladies Committee is also making preparations for the entertainment and enjoyment of visiting ladies.

Thursday has been set aside for Among the possibilities are visits to Carlsbad to inspect the potash mining and refining operations, sight-







seeing to the famous Carlsbad Caverns, and a possible trip to the Chino Mine and Mill of Kennecott Copper Cornoration.

Those who have not yet asked for accommodations at El Paso are urged to write or wire at once to J. J. Shores, secretary, mining committee, El Paso Chamber of Commerce, giving the date of arrival and departure. outlining specific reservation requirements and specifying whether or not travel to El Paso will be by automobile.

World's biggest dipper carried on Timken bearings

EVERY time the dipper on this giant Marion 5561 power shovel takes its 40 cu. yard bite of earth, the combined weights of the dipper and its contents (over 100 tons) are carried on the boom point sheaves. Every time this 100 ton load is raised or lowered, the boom point sheaves must rotate easily to prevent cable wear.

What kind of bearings can carry this tremendous load and operate freely, dependably? Timken tapered roller bearings—and here's why: Timken roller bearings are made from the finest bearing steel ever developed—Timken fine alloy steel. Due to the line contact between rolls and races, and the positive alignment of the rolls, Timken bearings have tremendous load carrying capacity. And even under tremendous loads their true rolling motion and incredibly smooth surface finish enable Timken bearings to operate freely, frictionlessly.

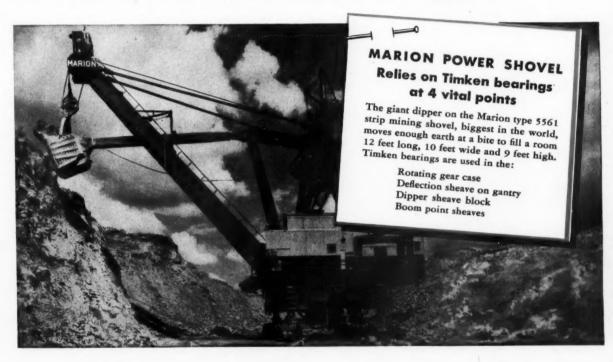
Timken bearings permit the use of closures which effectively retain

lubricants, saving both maintenance time and materials. Built to last, they normally outwear the machine itself. They take any combination of radial and thrust loads.

No other bearing can give your equipment *all* the advantages you get from Timken bearings. Be sure they're used wherever wheels and shafts turn on the machinery you build or buy. The Timken Roller Bearing Company, Canton 6, Ohio.



This symbol on a product means its hearings are the best.





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relieves stress and wear on the guide shell, stops excessive vibration and whipping. Control is easier, because feed and drifter controls are both located on the end of the drifter.

Here's unbeatable performance that pays off in faster drilling cycles, more footage with less effort, and all-around operating economy. That goes, too, for the other new Blue Brute Drifters—the WPMS (Pneu-Motor on shell) and WHC (Hand Crank) types. Each type comes in three cylinder sizes—3", 3½" and 4"—covering the whole range of drifter jobs, yours included, in a way that proves there's more worth in Worthington.

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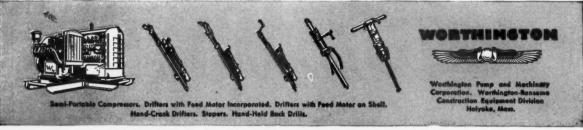


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Deep Mining Developments in The Coeur d'Alene



The Galena shaft is being enlarged to 4-compartment size by Federal Mining & Smelting Co.

By HARRY INGALLS "The Wallace Miner"

THROUGHOUT the Coeur d'Alene mining district, in northern Idaho, a deep development program is under way, a program unlike any other in domestic mining history. Five inde-pendent mining concerns in this dis-trict, Polaris, Silver Dollar, Coeur d'Alene Mines, Hecla and American Smelting & Refining Cos., are simultaneously engaged in sinking shafts to objective depths of 3,000 ft., which means to sea level, without pausing to prospect with crosscuts at intermediate levels, something that has rarely been done in the history of

Another large company, the Sunshine, is down to a depth of 3,700 ft., or 1,000 ft. below sea level, and the rich silver and lead ore developments opened by this company, on their own and adjoining properties, have encouraged other companies in their deep development plans covering territory

The Coeur d'Alene Mining District Expects to Increase Its Ore Reserves by Means of a Program of Deep Exploration. Already There Are Indications That This Program Will Extend the Life of the District for Many Years to Come

in a wide mineral belt over a distance exceeding 10 miles eastward of the Sunshine development. In addition, the Bunker Hill & Sullivan Mining & Concentrating Co., west of Sunshine, owner of the oldest and largest producing silver-lead-zinc mine in the district, has made extensive preparations at a cost of approximately \$811,359 to sink from the 2,800 level to the 4,000 level, which would bring its workings to 1,600 ft. below sea level. This would make Bunker Hill the deepest mine in the Coeur d'Alene district, or in the entire western mining area.

A Geologist's Opinion

The mineral belt which has inspired this deep development program is a strip of territory of unknown width extending eastward from the Bunker Hill and Sunshine mines for a dis-

tance of approximately 15 miles. In summing up the past and looking forward to future mineral developments in the Coeur d'Alene district, Robert E. Sorenson, head geologist for the Hecla Mining Co., spoke on this subject at the recent meeting of the Idaho Mining Association at Sun Valley:

"We in the Coeur d'Alene district," he said, "should feel particularly fortunate to be sitting in a district where so many development possibilities exist, and where persistent and well-directed development may yield ore bodies like those in Sunshine and Chester veins.

"The measure of the real worth of a mining district is its ability to sustain a continued and expanding production of metal over a long period of time."

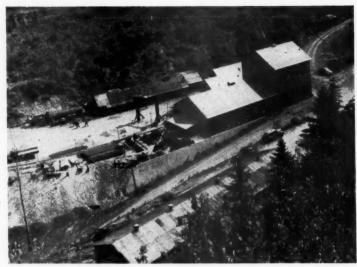
Mr. Sorenson stated that the Coeur d'Alene district is one of the eight mining districts of the world which has produced in excess of one billion dollars worth of metal.

In speaking of the prospects of the mineral belt in which the deep shaft development is now taking place, he said:

"The Coeur d'Alene district has seen several periods of new discoveries, and lately we have been privileged to watch the development of one of the greatest of the substantial disclosures made during the last 15 years in the so-called silver belt. Sunshine Mining Company's gradual development of their property through a long period of time, filled with many adverse results, finally accomplished the purpose of years of trial by developing one of the richest silver ore bodies ever discovered in the United States. This development renewed the hope of many neighboring properties, and resulted in an extremely active program of development. Discoveries since that time have served to intensify the search, which has resulted in one of the most active programs of deep development in progress in the United States."

The Chester Vein Is Opened

What is now recognized as the silver belt was first developed by the Sunshine Mining Co. After an uncertain period of searching, the Sunshine mine workings reached the 1,700-ft, level, where they hit the "jackpot," a big body of exceptionally high-grade silver ore. In 1943, when Sunshine was having difficulty in operating because of Government restrictions on gold and silver mines, the company was driving a drift easterly on the 2,700ft. level for the adjoining Polaris Mining Co., following the Polaris vein, which was an extension of one of Sunshine's rich silver veins. However, no commercial sized orebodies



Coeur d'Alene Mines is planning a new crosscut

were found on this level in Polaris ground although the same vein had been highly productive on upper levels.

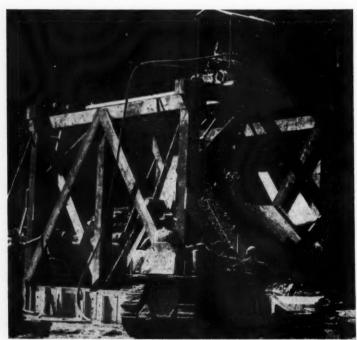
L. E. Hanley, president and general manager of both the Polaris and Hecla Mining Cos., decided to open what is known as the Chester vein, which parallels the Polaris, while the workings were available on the 2,700 level. The Chester vein had been thoroughly prospected down to the 1,900-ft. level by the late James F. McCarthy, Mr. Hanley's predecessor, but nothing had ever resulted except the proof that the Chester was a strong fissure with min-

eral indications. The miners working on the job of driving the crosscut from Polaris to the Chester called it "the last nail in the Chester coffin," but when the crosscut had proceeded 400 ft. it crossed a small streak of high-grade silver-lead ore some 10 in. wide, which was followed easterly and in a short distance widened to 30 ft. This continued a short distance to the west end claim line of the Rotbart mining claim, owned by the Lincoln Mining Co. and under 99-year lease to the Silver Dollar Mining Co.

In order to avoid extralateral rights lawsuits and to facilitate production of ore badly needed at the time by the Government, Polaris, Silver Dollar, and Sunshine Mining Cos. entered into an operating agreement whereby each company received one-third of the net profits resulting from ore extracted from the Rotbart area, which embraced 400 lin. ft. on the vein. Subsequent development proved the ore shoot to be shaped something like the letter "S," which increased the productive three-way partnership zone to 550 ft. The vein system outside of the Rotbart is divided into two sections, known as the Omega and Rambo Production from Omega is areas. equally divided between Polaris and Sunshine but property rights are owned by Polaris. In the Rambo area, property possession is owned half and half by Sunshine and Silver Syndicate Mining Cos.

Ore Proven with Depth

Because of its great depth and exclusive outlet facilities, Sunshine does all the mining and milling from these zones. They have been proven for a total stope length of over 1,000 ft., and extend downward to the 3,700-ft. level, beyond which no development has been attempted. However, on the 3,700 level Sunshine has developed



Hecla's Gem State shaft is being sunk with the Riddell Mucking Machine

another vein system in the Rambo area which is considered as one of the largest silver-lead ore deposits found in the United States during the past 30 years.

The Silver Dollar Mining Co. has developed in an independent shaft what is known as the Lincoln vein, but which, in reality, is an easterly extension of the Chester down to the 2,000 level. Out of a small shoot of rich silver ore, Silver Dollar mined approximately 12,000 tons which produced a high-grade concentrate carrying silver, copper, and gold, netting approximately \$120,000. After the Sunshine's deep discovery on the Chester vein, Silver Dollar decided to sink further to the same geological horizon, the objective point being sea level at 3,000 ft. and at 2,500 ft. has cut through the Chester vein on its southerly dip at a point where it shows a width of about 6 ft., all of which is well mineralized, with the last 2 ft. on the foot-wall giving an average assay value of 46 ozs. of silver to the ton. The shaft is being continued to its objective. At present Silver Dollar's independent shaft is down to a depth of 2,400 ft. and is progressing steadily. This property is 4,000 ft. east of the Sunshine development and is equipped with an Ingersoll-Rand air compressor of 525cu.-ft. capacity; two Coeur d'Alene hoists, 200 hp. at the shaft collar and 125 hp. on the 2,400 level; Gardner-Denver drifting machines; Gardner mucking machine and two electric trammers made by Gorensburg and General Electric.

Mechanization Enters the Picture

Polaris Mining Co. next enters the picture with a 3,000-ft. shaft development 2,000 ft. southeast of Silver Dollar. Polaris first acquired control



The Polaris Mill. First results from the Polaris deep development program are now being realized

of the Silver Summit Mining Co., which already had a 3-compartment shaft down to the 1,500-ft. level. Polaris unwatered this shaft and started sinking on February 1, 1946, completing the work to the 3,096-ft. level December 8, 1946, averaging 159.6 ft. per month, a record in this district. In sinking the shaft the company used the first mechanical shaft mucking machine ever employed in the Coeur d'Alene district. It is a clamshell digger device patented by J. Murray Riddell, of Houghton, Mich., and manufactured by the E. J. Longyear Co.*

While the shaft was in progress the Polaris Co. entered into an operating agreement with the Yakima-Shoshone, Mineral Mountain and Merger Mines Mining Cos. for the deep development

* Mechanical Mucking in Vertical Shaft Sinking, by George M. Grismer, MINING CONGRESS JOURNAL, November, 1946.

of their property holdings. These adjoin Polaris and Chester Mining Co. property, the latter of which is controlled by Polaris. First results of this deep development have now been realized in the south crosscut from the shaft on the 3,000 level, where a vein of rich silver-copper ore has been encountered at 950 ft. from the shaft. The ore exposed is 5 ft. wide and average assays give returns of 33 oz. in silver and 5 per cent copper per ton. No further development of this vein will be attempted at this time as the company hopes to cut other known veins at about 2,000 ft. from the shaft.

Discovery of rich ore in the Silver Summit vein was something of a surprise, since this vein did not show any values of consequence in depth to the 1,500 level. The crosscut work on the 3,000 level is progressing at the rate

(Continued on page 49)



Silver Dollar Mining Co. will explore the Chester vein

INCREASED PRODUCTION . .

LOWER COST PER TON . . .

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Loaders and Shuttle Cars for High or Low Seams

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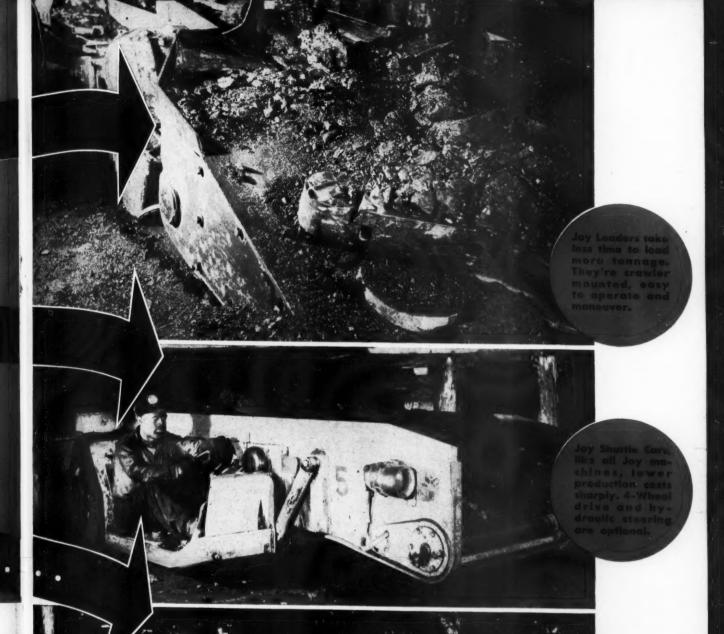
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Locomotive Fuel Performance



Railroads Must Continue to Carry Our Major Transportation Load and Special Coal Should Be Prepared for Locomotive Use

Fig. 1. A locomotive of 1865

Fig. 2. (Right) A railroad fuel mine of 1865

Fig. 3. A modern coal burning locomotive





Consulting Engineer
Pittsburgh Consolidation Coal Co.



A T first it may not be apparent why "Locomotive Fuel Performance" is of interest to coal producers. However, the use of the proper coal has a definite relationship to the overall performance of the locomotive as well as the stack discharge of both smoke and fly ash, and this presentation will offer some constructive suggestions for improving the quality and uniformity of locomotive fuel in order to meet the present motive power needs of the railroads. Today, railroad locomotives must operate with higher steam-

ing capacity, faster acceleration, greater speed, less cut-outs, fewer steam failures, lower maintenance and improved availability. In doing this modern job, they must also meet the irresistible public demand for new standards for stack emission of both smoke and fly ash.

Coal Must Be Retained as Fuel

There are at present 25,000 coalfired steam locomotives in active service in the United States and many are greatly handicapped because of inferior quality of the fuel used, its lack of uniformity, excessive fine coal content, and its relatively high cost. Scrapping these 25,000 locomotives, which are worth over five billion dollars, and replacing them with Diesel power, to cost another ten billion dollars, is a financial burden that even a pink professor of economics would not recommend to the railroads. The uncertainty of our oil reserves, the limited supply and rapidly increasing cost of Diesel oil, all forecast a longrange improved competitive position for our almost inexhaustible supply of coal for locomotive fuel.

Liquid fuels are highly refined products, and both the refineries and

⁽Extract of address presented July 9, 1947, to the Smoke Prevention Association of America, Toronto, Canada.)

the storage tanks are attractive and vulnerable targets in war time. Furthermore, it is extremely doubtful whether the oil industry, in the foreseeable future, could be equipped to handle the demands of our country in a highly mechanized war on the ground, on the sea, and in the air and. in addition, meet the needs of those railroads who fail to retain a major backlog of coal-burning steam power. For these reasons, it does not seem good judgment, nor economically sound, to discontinue the building of conventional steam locomotives, nor to write off existing steam motive power and replace it with Diesel power.

Fig. 4. A Niagara class locomotive in fast freight service





Fig. 5. Some mines today are using obsolete methods



Fig. 6. No preparation here in 1947

Steam locomotives, in spite of their limitations in space and weight, have been remarkably flexible as mobile power plants. They have been required to burn all kinds of unmerchantable products, surplus sizes, coals which are high or low volatile, high or low ash, high or low fusion. But with all of these handicaps, the "Iron Horse" has staggered ahead carrying almost the entire transportation load of the nation; and you can bet that in any future national emergency, our non-vulnerable storage piles of unmined coal underground will again be called upon to do the transportation job for our country.

The Development of Modern Locomotives

The coal industry, for its own sake, must realize that the modern steam locomotive must have better fuel if it is to compete with other types of modern locomotives burning competitive fuels. In the 12 months ending September 30, 1946, the eastern coal-producing districts of the United States shipped about 90 million tons of railroad fuel. In my opinion, less than 10 per cent of this coal was of the best quality and size available, in the region from which it was shipped, for optimum overall locomotive performance and operating cost. Over sixty and one-half million tons were run-of-mine.

Allow me to illustrate how the rail-

roads have developed. Fig. 1 is a reproduction of a steam locomotive of 1865, smoke and all. Many of you have seen it on the Pennsylvania Railroad calendar, and the way you identify the period is by the hoop skirt in the foreground. Otherwise, to the casual public observer, this locomotive does not differ too radically from some of the locomotives in service today. Now it is quite probable that this locomotive burned run-of-mine coal, which was practically the only size

available for general utilization in that day and Fig. 2 shows the methods of a typical coal mining operation of the same period. Here we find locomotive fuel loaded into wooden cars with wooden rail guides for flat mine car wheels, and the motive power units are dogs. The locomotive and the preparation facilities of the same day seem quite comparable.

In contrast, Fig. 3 shows a modern steam locomotive of the 1947 variety. This poppet valve engine of the Penn-

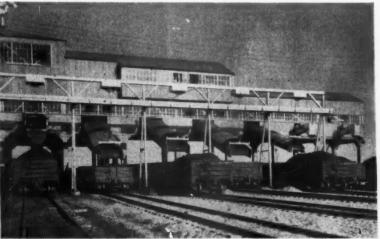


Fig. 7. A strip mine preparation plant for high-quality fuel

sylvania Railroad produces more horsepower at 100 miles per hour than any engine ever built. It has a conventional stoker, fire-box and boiler and it would seem reasonable that this locomotive should use a coal whose preparation and sizing is as up to date as its own design. Another modern type is New York Central's Niagara class engine which produces 5,000 draw-bar horsepower. Locomotives in this class have exceeded 28,000 miles per month when burning washed, double-screened coal. They will pull 14 to 16 passenger cars at 90 miles per hour, and are fueled twice en route on a daily run of almost 1,000 miles between Harmon and Chicago. Figure 4 shows this locomotive operating in high-speed freight service—fast freight at passenger-train speeds—and roller bearings from end to end. Undoubtedly a mod-

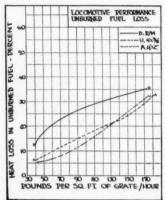


Fig. 8. Unburned coal loss

ern locomotive fuel should be prepared for these modern locomotives in this type of service.

Evolution of Coal Preparation

Permit me to show you a common variety of small mine operation that produced much of the run-of-the mine coal which was burned during the last war by the railroads, as illustrated by Fig. 5. This picture was taken in 1941 and shows a sad but true situation—a wooden mine car being hauled from a hole in the hillside on small rails. The car wheels have flanges, but really the only noticeable change since 80 years ago (Fig. 2) is that the dog has been replaced by the horse. The coal is still hand-loaded mine-run.

Fig. 6 is a picture of a preparation plant taken in 1947. Many of you have seen such tipples for loading coal as hundreds of them contributed to the sixty and a half million tons of mine run which the railroads bought last year. This dump is loading strip coal for locomotive use today and I mean "dump" literally, with no prep-



Fig. 9. A coal cleaning plant of Pittsburgh Coal Co.

aration provided for the coal being purchased for railroad service. Without doubt, the hand-loaded, dog-pulled coal of 1865 was a much better locomotive fuel than the coal loaded in this operation, because the hand-loaded coal in the old days was cleaned at the face.

Don't be misled, however, by the term "strip coal." Much of it is prepared in modern cleaning plants with complete preparation facilities, which produce a quality equal to the best deep mined coal and with the uniformity of analysis and size that is required for optimum locomotive fuel performance. See Fig. 7.

Tests Showing Unburned Fuel Loss

Fig. 8 shows three curves which represent the unburned carbon loss for three sizes of coal in burning rates ranging from 40 to 170 pounds per square foot of grate per hour. The "D" curve shows losses ranging from

121/2 to 35 per cent in this range for run-of-mine. These tests were all made on a modern locomotive; on older engines, the heat loss might range from 25 to 50 per cent in this range of burning rates. The two lower curves, "A" and "U," represent the heat losses due to unburned carbon for 4-in x 2-in. and 4-in. x %-in. washed egg. By comparing the losses at a reasonable average burning rate of 100 lbs. per sq. ft. of grate per hour, it will be noted that there is 11 per cent saving for the 4-in. x 2-in., as compared to mine run and a 14 per cent saving for the 4-in. x %-in. size, as compared to mine run.

These figures show real tangible savings that were obtained in the test plant. In addition to this, there are many intangible savings which are difficult to evaluate. Uniformity of quality and size, lower ash, and practically no foreign matter in the coal mean lower maintenance costs, less cut-outs, and fewer fuel failures due to slagging, clinkering, plugging of



Railroad fuel needs this type of preparation

flues and netting, all of which results in improved availability and reduced overall operating cost. Incidentally, this improved quality, sizing and uniformity of locomotive fuel enable the fireman to maintain better smokeless performance, and it is quite evident from the curves that the reduced amount of fly ash will also favor the public acceptance of this type of motive power.

Now why don't the railroads buy only double-screened, washed coal for road locomotives? One reason is it may not be immediately available. Another reason is that they may not be sure that its increased cost will be justified by its improved performance.

High Cost of Modern Preparation

Fig. 9 will show why it costs more to prepare coals which are uniform in quality and properly sized for any consumer's needs—facilities to provide the size the customer needs for best performance and lowest overall operating cost. Locomotive fuel is no exception. These mines are mechanized underground to offset increased labor costs, and then these modern facilities above ground are provided for quality control and siz-



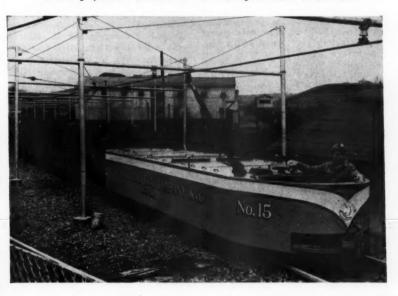
Smoke prevention goes into action

ing in order to satisfy critical consumer needs.

Why doesn't the coal industry make this change from run-of-mine to double-screened, washed coal at once? There are several obstacles—It requires lots of time and money to build this variety of preparation plant, the cost of which must be amortized by the reserves available. Changing from run-of-mine to egg also requires balanced selling of nut, stoker and slack sizes in many directions and this also takes time. Another good reason is that the railroads don't know what size they want or whether they are justified in paying a cost above



All mining operations are mechanized at Pittsburgh-Consolidation Coal Co.



that of run-of-mine, which is sufficient to make it worthwhile for a producer to take the gamble of providing the facilities.

This job of selling both coal producers and railroads the need for washed double-screened locomotive fuel is now in the mill. I am tugging hard at the research purse strings in an attempt to obtain test facilities for use by all the railroads and for a test fund which can be used immediately to obtain accurate relative values berun-of-mine and doubletween screened coals from the same mine. Such information is necessary to the establishment of regional standards for locomotive fuel in each of the producing regions of the United States.

There is one serious worry causing

loss of sleep because of present conditions. There is a terrific increase in the demand of coal for the utilities, and these companies are now protecting their sources of supply for plants under construction. By all rules of reason, these big modern utility plants should burn the poorer grades of fuel, because their equipment is sufficiently flexible to recover full value on a heat value basis. Size as such is worth no premium. Now, while the railroads are making up their minds whether double-screened coal is worthwhile, it may be found that the better prepared coals will be gobbled up in other directions and once again the railroads will -of necessity-burn unprepared mine-run grades because that is all that will be left. Cooperative planning will correct this condition.

Methods of Pillar Recovery

Reports by the Committee on Mechanical Loading, Showing Details of Pillar Extraction Under Different Types of Roof

THE joint study on coal recovery by the Mechanical Loading Committee and the Roof Committee is continued in the reports presented here which cover the operations of two companies in two fields and, following the recommendations made at the last committee meeting, describe the detailed procedures used in actual pillar extraction. Each company has been working pillars for some years, and consequently their methods are in no sense experimental but are the result of considerable practical experience. Both managements report a satisfactory roof action and a high percentage of coal recovery, so it would seem that in each operation the mining plan has been successfully designed to meet the physical characteristics of the seam and the overlying strata at these particular locations.

Both are working thick seams but under dissimilar roof conditions, and the reports are of special interest in that they describe two entirely different mining systems and methods of pillar extraction. Each one operates retreating, starting the rooms at the top of the entry after it has driven up to the panel barrier, but from that point on they have little in common, as the accompanying maps show.

Mine B uses the standard room and pillar system with rooms 22 ft. wide and with 28-ft. pillars between. Mine A uses the block system, driving narrow rooms 15 ft. wide on 100-ft. centers with breakthroughs cut to make solid coal blocks 85 ft. square. In each case the pillar is started back immediately when the room has reached its length, but each mine has its own method of extraction. Mine B takes cuts 20 ft. wide through the pillar, leaving a 6-ft. fender inbye against the gob, which is later recovered as shown in Fig. 3. Mine A first splits the 85-ft. block and then takes each half by open-end cuts.

Both managements maintain strict supervision over the sequence of making the pillar cuts and in keeping a straight break line, on an angle of approximately 45 degrees to the heading. Mine B, however, carries a long pillar line across three room panels, while Mine A has short line confined to one room entry, in which the roof acts independently and is uninfluenced by the mining in the adjacent panels.

All of these points are clearly shown and described in the following detailed accounts.



The mine which is now practically on full retreat was originally developed for hand loading by the room and pillar method but has been changed to a mechanical operation using shortwall cutters, post-mounted electric drills and mechanical loaders, both track and tractor mounted, loading directly into 3-ton mine cars.

Mining and Drawing Pillars

The general plan of mining is by the block system. Rooms panels are developed by a pair of entries turned on 300 ft. centers and driving to the panel barrier. After reaching its limit, each entry is then worked back by the block system as shown in Fig. 3, mining on full retreat with the narrow work and the pillar recovery as a continuous operation. Rooms 15 ft. wide on 100 ft. centers are driven off the entry to a length of 200 ft., leaving a 50 ft. solid barrier of coal against the gob on the adjoining panel; this barrier remains in only temporarily and is mined as the entry retreats. Cross-cuts 15 ft. wide are driven between the rooms 100 ft. apart and parallel to the butt entries; this forms solid coal blocks 85 ft. square.

The first operation in the pillar extraction is to drive a cross-cut 15 ft. wide through the center of a block, parallel to the butt entries, thus making two pillars 35 ft. x 85 ft. These half-blocks are then mined by a series of open-end cuts 17 ft. wide, taking across the 35 ft. end of the pillar and in the sequence as indicated by the numerals on the map in Fig. 3. Four lifts are made across the pillar in this manner, which leaves a coal stump 17 ft. x 35 ft. next to the room breakthrough. In mining this stump, the procedure is changed as shown by cuts 25, 26 and 27 on the map, which is done to eliminate the possibility of having a roof fall block off the far corners of the pillars. This method continues until the entry has been

PILLAR RECOVERY UNDER MEDIUM STRONG ROOF

By J. A. Younkins

M INE A is located in the Thick Freeport Field in Western Pennsylvania. Normal coal height including 14 in. of bone band in the middle of the coal bed averages about 80 in. However, the property is irregularly dotted with "want" areas or "washouts" where the coal has been wholly or in part replaced with sandstone, and coal heights in the vicinity of these areas are quite variable.

Roof conditions are somewhat variable but are generally good for the purpose of controlling falls. The coal bed lies immediately beneath the Mahoning sandstone, which averages about 50 ft. in thickness. Generally between the sandstone and the coal there is a layer of hard vitreous black shale sometimes called "cannel coal"

ranging from a few inches to 2 ft. thick, above which is a bed of sandy shale from 2 to 3 ft. thick. However, at times the cannel coal and shale will be missing and in its place a variable bed of hard clay or draw slate of unpredictable thickness. Again, the sandstone may rest directly on the coal particularly near the "want" areas.

The coal is underlain by fire clay which remains fairly hard if kept well drained but softens when the bottom is wet. For this reason 5 to 6 in. of coal are left to form a floor, under a 1 in. shale binder which serves as a natural parting. The coal bottom is streaked with shale and sulphur bands and would be hard cutting and low quality if mined.

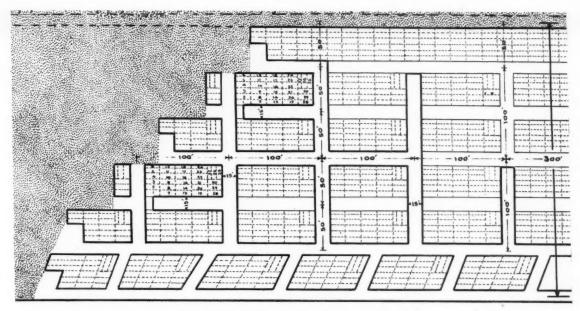


Fig. I. Mine A uses Block System under medium strong roof

mined out down to the barrier pillar.

After a major roof fall has been made, a thin curtain of coal, perhaps 2 ft. thick, is left for the first two or three cuts on the lift where the fall area feathers out toward the outbye block of solid coal, thus producing a slope on which additional rock, in falling, may slide into the lift, knocking out posts on the gob side. This curtain is feathered out after the second cut, when the point in the lift is reached where the fall from the preceding lift has come in tight and forms a vertical wall on the gob side.

The first major fall in a panel usually occurs when the gob line has

retreated from 250 to 300 feet from the barriers. Minor falls extending part way into the Mahoning sandstone occur in the neighborhood of 50 ft. back from the barriers. After a major roof break, each succeeding lift across a pillar produces its own major fall, and it usually requires between 24 and 48 hours after completion of a lift before the fall comes in, although at times the place may begin to work before the last cut in the lift has been loaded out. On the other hand, occasionally a fall may not come in for three or four days after the lift has been completed.

As the map indicates, each entry is mined out independently, giving short rib lines on a 45 degree angle, instead of the alternate plan of long rib lines extended across several entries. Our experience with our present system has proven that the short rib lines are practical and result in a better percentage of extraction. The average recovery for hand loading from 1931 to 1940 inclusive, compared with the recovery for mechanical loading from 1941 to 1945 inclusive, shows that a definite improvement in the percentage of extraction has been made with mechanical mining.

PILLAR RECOVERY UNDER VERY STRONG ROOF

By J. F. Mazza

M INE B, as covered in this report, is in the Lower Freeport measures with an average cover of about 400 ft. The seam is 72 in. high, including 6 in. of middle binder. The roof immediately over the coal is very tender, but from about 5 ft. above the vein the strata consists of strong, tough slate and shale with practically no sandstone unless near a faulted area. The coal is underlaid with a hard fire-clay bottom that makes an excellent floor for the haulage system.

Mining System

All work in this mine is done on what we call "single entry full retreat." As shown on the map in Fig. 2, this may be, and usually is, on an advancing base along the flat

entry in order to maintain a good ratio between development and production work. The flat headings are driven as a 6-entry system; the middle two entries are the main haulage road and side track and are intake airways, while the two outer entries, on either side of the flat, are used as return air courses. Butts are turned as a 2-entry system on 350-ft. centers off the flat and are driven up their entire distance before any rooms are turned. A third entry is driven off the flat for a short distance of about 150 ft. in order to establish an air lock of sufficient length to accommodate a haulage trip.

Development work is so arranged as to provide a total of 10 working places; 5 are on pillars and 5 are driving rooms, making a substantial set-up for either hand or mechanical mining. A 2½-ton mine car is used at this mine, and a motorman and spragger can handle 70 to 80 cars on a run such as described above. This will produce about 200 tons per shift for a mechanical unit, or about 10 tons per man on hand loading.

Pillar Recovery and Roof Action

Rooms are turned on 50-ft. centers, starting at the top end of the entry and working on a full retreat basis. They are 22 ft. wide, with a 28-ft. pillar, which is recovered as soon as the room has been driven up. Crosscuts in the rooms are driven on such centers as to provide systematic chances across the pillar and a typical chance consists of a 6-ft. back stump and a 20-ft. lift (see Fig. 3). After the lift has been driven through to the previously caved area, a cut is

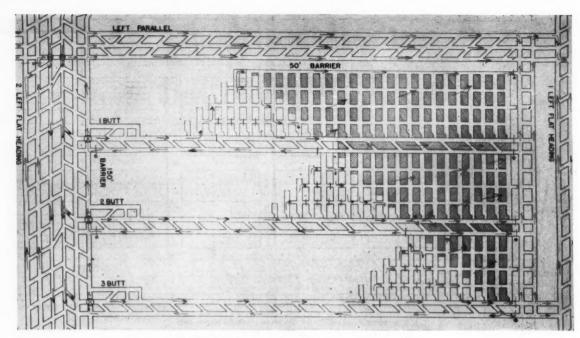


Fig. 2. Mine B carries the pillar line across three panels

made in the back stump, leaving a 3-ft. tail stump and 5-ft. head stump for further protection. After this back stump cut has been loaded out, whatever coal that can be mined from the head and tail stump is immediately taken off, and the place allowed to cave. Careful planning has to be done in this latter work to see that the strength of the coal stumps is entirely removed because leaving these pillars with any roof support in them would immediately cause a ride or creep over active workings.

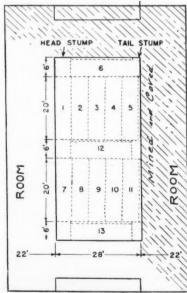


Fig. 3. Sequence of pillar cuts

Pillar lines across butts are maintained on about a 45-degree angle, and all coal is taken out of the butt down to and including everything but the chain pillar. This chain pillar is left in and is taken out by the next succeeding butt, in order to provide adequate ventilation in case the line or bleeder rooms at the top of the butts become congested.

Where a new panel is started retreating in this mine, a big roof fall, extending into the upper strata and relieving the roof pressure, usually is not obtained until about two butt headings have been partly retreated. A small, or first fall, generally occurs after several room pillars have been taken out, but the second, or heavy fall, does not come until the pillar line has been extended over several butts. After the second fall occurs, there is very little difficulty encountered if the retreat line remains regular, but if pillars are allowed to drag back or if back stumps are left in, you can look for trouble until those conditions are corrected.

In the usual operation of the mine, pillar lines are extended over three or four butts diagonally, and close supervision is applied to keep these lines correct. In a strong, tough roof condition such as we have at this operation, it appears evident that long pillar lines provide better mining than short ones. Short pillar lines have a tendency to allow the strong roof to sag rather than break, and is very liable to cause a squeeze on the pillar ribs which in turn may prevent getting the coal out, causing further trouble.

Careful Ventilation Planning

One or more developing butts are put on an air split and all splits can be directed into the returns by overcasts at the bottom of each butt. Bleeder or line rooms are driven at the top of each panel, tying into the line rooms driven from the preceding butt to provide direct ventilation to the fan.

Ventilation has three possible outlets in each butt. Usually the pressure is kept against the falls and air goes out the line or bleeder rooms at the top of the heading, but there is also another outlet through the air course of the butt heading that is being worked. In addition, one room is always kept cut through to the last butt heading retreated (whose chain pillar has been left in) providing the third way out for the air, if necessary. Any openings other than the line rooms are regulated to keep the maximum amount of air against and over the falls direct into the main return.

Conclusion

Recovery percentages for the mine are very good. Tonnage figures have been kept very carefully, and the mined-out areas checked as close as possible, showing a percentage of recovery as high as 94 per cent, although the average has been near 90 per cent over the entire pillar area. This difference is accounted for by the fact that there are numerous clay veins where close supervision has to be applied. These clay veins have to be mined out or they would act the same as a coal pillar and cause squeezing.

Mining Developments In Coeur d'Alene

(Continued from page 39)

of 6 ft. to the round on a 3-shift basis in a 7 x 8-ft. heading. The equipment used includes an Ingersol air compressor; a Coeur d'Alene type, doubledrum, 250-hp. hoist; Ingersoll-Rand D.A.35, power feed drills; 1%-in. hollow round steel using Timken Type M bits; a new Norse-Ingersoll jumbo; Eimco Finlay 12 B mucking machine, Mancha-Jeffrey electric trammers.

Next comes the Coeur d'Alene Mines Corp. development on the silver belt 6,500 ft. northeast of the Silver Summit shaft. This company developed a rich silver vein on the 1,400 level and followed it on down to the 1,800 level, where the ore lost its silver value. Up to this point the company had paid \$550,057 in dividends and erected a modern 600-ton flotation concentrating mill. From the 1,800 level the company continued the shaft to the 2,800 level, where the vein has been crosscut, but so far no important orebodies have been developed.

During the sinking of the shaft the Coeur d'Alene Mines Corp. entered into an agreement for a 50 per cent interest in the American Silver Co. claims adjoining it to the south. Coeur d'Alene Mines planned to drive the 2,800-level crosscut through American Silver ground and on through a large group of claims owned by the Coeur d'Alene Mines Extension Co., this at the latter's expense for an interest in possible mineral products. The equipment used by this company includes two Ingersoll-Rand 10 x 12 air compressors; Ingersoll-Rand and Gardner-Denver drilling machines; 500-hp. Coeur d'Alene hoist, Eimco-Finlay mucking machines; 1½-ton Mancha electric trammer.

Shaft Being Deepened to Sea Level

Next in line of deep shaft development in the silver belt is the operation of the American Smelting & Refining Co. Early in 1947 this company entered into an agreement with the Callahan Zinc-Lead Co. by taking a 60-year lease on a group of claims in the silver belt 1,300 ft. southeast of the Coeur d'Alene mines. These claims are owned by the Vulcan Mining Co., a subsidiary of Callahan Zinc-Lead, and were formerly called the Galena group. Callahan sunk an 800ft. shaft on these properties and constructed a 150-ton milling plant which produced high-grade lead ore valued at approximately \$750,000 when lead sold for 8c per pound. The ore carried only 1 oz. of silver to the unit of lead. The American Smelting & of lead. The American Smelting & Refining Co. has agreed to extend the Galena shaft to sea-level depth

of 3,000 ft. and to drive 5,000 ft. of lateral crosscuts at an estimated expenditure of \$600,000. The work is being done under the supervision of the Federal Mining & Smelting Co., and a crew is now engaged in enlarging the Galena shaft to 4-compartment size. This operation is not yet fully equipped.

Hecla Mining Co. has entered the silver belt deep shaft development the farthest east of any active operation and is located 2 miles southeast of the Galena operation. Hecla purchased and located a group of 131 mining claims comprising 2,620 acres on Rock Creek, midway between Wallace and Mullan, and incorporated the Rock Creek Mining Co. as a subsidi-

ary. The company has started sinking what is called the Gem State shaft of 3-compartment construction, bordering No. 10 highway near the Federal Co.'s air-compressor plant. From the deep levels of this operation it will be necessary to crosscut some 10,000 ft. southerly to prospect a series of promising vein systems. Surface mineral showings are being prospected by bulldozer operation, and in order to gain access to them the company had first to construct a zigzag road 7 miles long up the mountain side. In the shaft operation the company is using the same Riddell clamshell mucking machine so successfully employed in sinking the Silver Summit shaft of Polaris Mining Co.

Ball-Mill Classifier

(Continued from page 25)

pense of ball wear and power. The fact that it ground this much per hour was surprising, because the balls were not as "active" as they were in the 12-in. mill. Most of the grinding took place in the lower layer of balls.

After grinding about 75 tons of material, there was no apparent liner wear. The accompanying diagrammatic sketch, Fig. 1, referred to in describing the mill, shows the ideal shape and rotor design.

Power Savings Indicated

It is believed with these changes that the mill will grind about 50 to 60 tons for 24 hours, with a saving in power of about 40 per cent over the conventional mill, and with a comparable ball wear. Just as in the testing of the small ball mill, it took quite a while to learn how to operate the mill properly, so that the results we have obtained to date are not indicative of what a properly operated mill will do.

The density gauges and controls worked perfectly. It is believed that in grinding a heavy sulphide ore that some important economies can be effected by floating out the harder gangue minerals and screening the overflow on a screen. In this way, the undersize of the screen would be a finished product, and the oversize could be rejected if valueless, or reground in a separate mill. This would tremendously minimize overgrinding of the sulphide. The operation would be something like a sink and float operation in the ball mill itself.

In these tests an integrating wattmeter was used which gave the total power consumption for the test. Frequent momentary readings were taken. These varied considerably. With the use of a wooden stick we could feel into the mill to study the action. At times the balls did not cascade properly; there was considerable slippage. As was previously noted, the rotor and bowl should have been cast to approximate the shape of the original 12-in. unit.

Dry Grinding Test

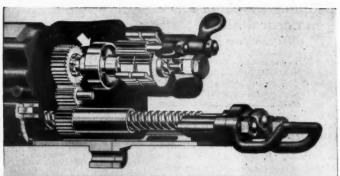
In the original 12-in. mill a few tests were made grinding dry. No proper suction fan or dust separator classifier was available, to recover the ground product and permit returning the oversize to the mill. There is no apparent reason why the mill should not be equally as efficient in dry grinding as wet. A few modifications would be necessary: the centrifugal seal would be changed and a simple control on the oversize returned to the mill from the air classifier would be used instead of the density gauges.

Rough Sink-Float Separation

In making the initial tests on the 24-in. mill, the feed was shoveled onto a conveyor belt from a stockpile of the crushed quartz and limestone. Some blacksmith coal and coke has previously been stored in this same location. When remnants of these got mixed with the rock feed to the mill, these particles of coal and coke would float to the surface of the weir over-This immediately suggested flow. that if the mill were used for grinding sulphide ores there might be some interesting results which could change the grinding practice of such ores. Important economies might result in grinding and in the subsequently metallurgical steps. A few hundred pounds of lead and zinc ore were obtained and ground in the 12-in. ball mill-classifier. Just as was expected, the schist and quartz gangue were floated out of the mill.



Here's the Inside Story



of the Drifter that Feeds Itself



To find out why the Gardner-Denver CF89H Drifter feeds accurately and automatically in accordance with the character of the ground, look at the view of its working parts. The Gardner-Denver Automatic Feed uses a relatively slow moving piston, the reciprocating motion of which is translated into a rotary motion by a simple system of rifling which rotates the feed nut on a stationary screw. The action of this feed maintains the drill at the correct striking position, increasing the drilling speed and reducing maintenance. No time-wasting manual adjustments are necessary in drilling. Other big advantages of the Gardner-Denver CF89H Continuous Feed Drifter are:

Centralized control—all controls are located in the back-head—operator does not need to stretch from feed control to drill throttle when easing the drill through bad ground.

Easier on the set-up—because of the absence of vibration, the CF89H is easy on the set-up—can be used safely out on the end of extra long arms in stope drilling and in wide tunnels.

Single air hose—the feed motor receives its air from the main air supply of the drill, eliminating the extra air hose, fittings, etc.

Low air consumption—air consumption of the Gardner-Denver Continuous Feed is negligible owing to the relatively slow moving motor piston. The feed motor uses but 3% to 5% of the total air consumption of the drill.



GARDNER-DENVER

SINCE 1859

For bulletin describing Gardner-Denver Continuous Feed Drifters, write Gardner-Denver Company, Quincy, Illinois



As Viewed by A. W. DICKINSON of the American Mining Congress

CTIVITIES of the first session of the 80th Congress were wound up early in August by White House approval or disapproval of bills passed in the last hours of the session. Attention of the Administration has since centered on the problems of Europe, including the difficult financial situation in Britain and international conferences on the Marshall Plan. Although the President reiterated, before his departure for South America, that he saw no reason for calling a special session of Congress. State Department spokesmen appear to be paving the way for such a session in order to speed measures for early assistance to the distressed countries of Europe.

Tax

Treasury Secretary John Snyder has made the latest move on the tax revision front by retaining three specialists to aid in preparation of a tax program. One appointee is Harold V. Amberg, vice president and general counsel of the First National Bank of Chicago, who on numerous occasions has acted as consultant to the Federal Reserve Board. The other two specialists are from Columbia University, one being William C. Warren, a tax attorney, and the other Dr. Carl Shoup, a one time assistant to Treasury Secretary Morgenthau.

Meanwhile the tax specialists of the House Committee on Ways and Means and of the Treasury Department are going forward with discussions for the revenue law revision program, including excise tax changes and community property proposals. They hope to present recommenda-tions to the Ways and Means Committee when public hearings are resumed November 4, and plans call for the introduction of a revenue bill in January.

To assist in the work of revenue law revision, the Tax Committee of

the American Mining Congress has submitted a statement urging various changes in the Revenue Code in the interest of fair and equitable treatment of the mining industry. The recommendations made are based on studies carried on for many months and include specific language for technical and administrative amendments needed to remove existing inequities and deterrents to mining enterprise.

Specific recommendations call for: (1) definition of "net income from the property" for purpose of percentage depletion, to require deductions only for those expenses related to production of income from the particular property; (2) definition of "mineral property," to afford the taxpayer an option as to the grouping of mineral interests constituting a single operating unit; (3) definition of a "metal mine" to include any property whose ore is mined for its metal content; (4) clarification of the law to permit development and preliminary mining expenses to be charged off-separate and apart from depletion-either when incurred, or as deferred expenses recoverable against the mineral benefited.

Other problems treated are changes in the handling of depreciation allowances to permit full recovery; a provision permitting taxpayers to amortize 25 per cent of current capital expenditures over a period of not more than five years, with the remaining 75 per cent to be subject to regular depreciation deductions; provision that the net operating loss carry-over be such as will make the net income of the combined loss period and period to which the loss is carried over, taxable to the same extent as if the two periods represented a single taxable year-thus eliminating the present discrimination against percentage depletion and against dividends received; provision for retaining the present two-year carry-back of losses

Washington Highlights

WHITE HOUSE: Turns attention to foreign affairs.

TAX: AMC recommends needed amendments.

TRADE AGREEMENTS: Senator Millikin warns against tariff cuts.

TAFT-HARTLEY ACT: New NLRB starts work.

DEPLETION: Knutson-Gearhart bill now law.

PREMIUM PRICE VETO: Ploeser pushes "stockpiling bill,"

WESTERN HEARINGS: House subcommittee to hear mine operators.

EXPLORATION PREMIUMS: Mittendorf explains policy.

USBM DIRECTOR: Dr. James R. Boyd

and extending the carry-forward period to five years; elimination of the tax on intercorporate dividends. and exemption of dividends received by individual stockholders from the first normal and surtax bracket (thus removing in part the double taxation of corporate earnings); reduction in the rate of tax on capital gains from 25 per cent to 121/2 per cent; reduction in the corporate tax rate from 38 per cent to 33 per cent, and to 25 per cent if possible; a ceiling of 50 per cent on the individual income tax and ultimately a 50 per cent top rate under the individual income tax scale; computation of interest due from the taxpayer or from the Government on the basis of the net deficiency or refund; and repeal of the excise tax on freight, which is particularly burdensome to the mining industry.

Foreign Trade Agreements

Senator Eugene D. Millikin, of Colorado, Chairman of the Senate Committee on Finance, has stated that the reciprocal trade agreements program of the Administration will meet strong opposition, when its further extension is requested, unless strict curbs are placed upon the power to arbitrarily reduce tariffs. Millikin indicated that he did not believe the entire foreign trade agreements program would be repealed or nullified, but he urged the consideration of "danger points" below which tariff rates can not be reduced by executive order. The Senator has specific reference to the power in the statute under which the President may reduce rates by as much as 50 per cent without the approval of Congress.

Meanwhile the World Trade Conference at Geneva is drawing to a close. The representatives of this country have been unable to secure agreements on import quotas, exchange controls, State trading, and on Empire-preference trading by Britain and her Dominions. There was no "round-robin" trade agreement, as intended by United States negotiators under our Reciprocal Trade Agreements Act.

Taft-Hartley Act

Recess appointments were given by the President on July 31, as members of the enlarged National Labor Relations Board, to former Senator Abe Murdock of Utah and to J. Copeland Gray; a similar appointment was given Robert Denham as general counsel of the Board. All three of these men had failed of confirmation by the Senate and their nominations will have to be submitted to the Senate again in January, if they are to continue in office.

Another interim appointment made by the President is that of Cyrus S. Ching, former U. S. Rubber Co. official, as Director of the New Federal Mediation Service established under the Taft-Hartley Act.

This new "Labor Management Relations Act, 1947" became fully effective on August 22. It replaces the old "Wagner Act" as it has existed since 1935.

The expanded 5-man NLR Board has ordered priority given to cases involving jurisdictional disputes. This action followed the direction in the law to give priority to cases involving secondary boycotts, jurisdictional strikes and organizational strikes.

Further announcements made by the Board are that hearings are not mandatory in cases where a union petitions for a referendum for a union shop. If the Regional Director finds that at least 30 per cent of the employes desire a union shop and there is no question of representation, he may hold an election immediately. It is further specified that if a regional director dismisses a union's charges of unfair labor practices, the union can appeal to the general counsel of NLRB within ten days; if the regional director refuses to proceed with a petition for a collective bargaining or a union shop election, appeal may go to the Board itself. It is likewise stated that no investigation will be made of unfair labor practice charges unless the union has filed

with the Board the required non-communist affidavits and unless it presents, within ten days after filing the affidavit, a letter from the Secretary of Labor stating that it has met the registration requirements of the Taft-Hartley Act.

Percentage Depletion— Non-Metallics

On August 8 the White House gave its approval to the Knutson-Gearhart bill, H. R. 4069, which reenacts the 15 per cent depletion allowance for a number of non-metallic minerals and grants the allowance to several additional minerals. As explained in previous issues, this provides for the allowance of depletion at the rate of 15 per cent of the gross income from the property (not to exceed 50 per cent of the net income), for bauxite, fluorspar, flake graphite, vermiculite, feldspar, mica, talc (including pyrophyllite), lepidolite, spodumene, barite, ball, sagger and china clay, phosphate rock, rock asphalt, trona, bentonite, gilsonite and thenardite.

Premium Price Bill Veto

The President's veto of the Allen bill, H. R. 1602, which would have continued premium payments on copper, lead and zinc for two more years, and would have instituted similar payments on manganese production, came as a distinct surprise to the industry. An accompanying memorandum called attention to the President's comment two years ago, when signing a bill which continued various wartime subsidies, that "these programs must be reduced or discontinued as rapidly as feasible whenever such payments become no longer necessary for war purposes." The message criticized the Plan as "too inflexible to meet present stating that lead is the scarcest of the three principal metals, and that the bill would not permit any major revisions in payments to shift the emphasis from zinc to copper and lead production.

The veto of the Allen bill was criticized by O. W. Bilharz, of Baxter Springs, Kans., president of the Tri-State Zinz and Lead Ore Producers Association, who said, "In the Tri-State district where 25 per cent of all domestic zinc production originates, operations have almost been brought to a standstill and are not expected to return to more than 50 per cent of normal. . . . We do strongly urge that Congress make a thorough and complete investigation of the marginal mine situation with a view of establishing a mineral resources law that will be acceptable to the Chief Executive, the industry and the people as a whole."

Representative Walter C. Ploeser, of Missouri, Chairman of the House Committee on Small Business, saw in the veto of the Allen bill support for

his "stockpiling" measure, which he asserts will assure an adequate supply of mineral resources to meet the military needs. Ploeser states that his bill "directs the Army and Navy Munitions Board to make contracts for the production of domestic mines, marginal in character, at prices in excess of the world market price. The output of the marginal mines would then be put in an A & N M B stockpile." Ploeser emphasized that stockpiles of strategic and critical materials have been so depleted that the national safety requires an "immediate incentive plan for the continuation of marginal operations."

Western Hearings

As Chairman of a House Small Business Subcommittee, Representative Ploeser has announced four hearings in the West to obtain the views of mine operators on conservation of existing ore bodies, acceleration of prospecting, exploration and development of copper, lead and zinc resources, and the desirability of extending the Premium Price Plan. The Subcommittee will also investigate the gold mining situation, the question of "monopolistic control" in the mining industry, and "sliding scale contracts with smelters."

Hearings are now scheduled as follows: Seattle, September 8; Reno, September 15 and 16; Phoenix, September 29 and 30; and Denver, October 2 and 3.

Other members of the Subcommittee are Representatives W. S. Hill (Dem., Colo.); H. M. Jackson (Dem., Wash.); and W. H. Stevenson (Rep., Wis.).

Exploration Premiums

The policy of the Office of Premium Price Plan, Department of Commerce, with respect to payment of exploration premiums has recently been set forth by Director C. O. Mittendorf. Applications for exploration premiums which have valid dates prior to June 30, 1947 (expiration of Premium Price Plan), and which have not been acted upon will be processed as soon Applications received as possible. after June 30, 1947, will not be processed. In the case of projects already authorized, revisions will be made within the sums previously approved. Such an action could be had, for example, where a mine operator has a premium authorization on a certain project, such as to drive 1,000 feet along a specific drift, but has found this unproductive after he has gone 500 feet. Application to abandon this particular drift and explore another in the project may receive consideration when it does not involve payment in excess of the amount authorized.

It is stated that the Office of Pre-(Continued on page 68)

Personals

Theron G. Gerow, formerly vice president, has been elected executive vice president of Truax-Traer Coal Company. Mr. Gerow had served as vice president since 1941 and prior to that time

to that time had been chief engineer. He joined the joined the North Dakota division of the company in 1927 as engineer and became superintendent of the Wilton mine there in 1930, a position he held for five years. In 1935



he came to Illinois to superintend the development of the company's Fiatt mine and during that year was made chief engineer with headquarters in Chicago. He is a graduate of the University of Minnesota.

John C. Carrington has been elected assistant to the president of Freeport Sulphur Company by the board of directors, Langbourne M. Williams, Jr., president, announced Aug. 7. Mr. Carrington, a native of San Antonio, Texas, and a graduate of Princeton University, joined the Freeport organization in 1939.

Grant F. Hall, Blackmont, Bell County, Ky., has been appointed a district mine inspector by Gov. Sim Willis of Kentucky.

On August 1, Carl K. Carmean, well-known Tri-State mining engineer, terminated his services as superintendent of the Sucker Flat open-pit mine operated by F. W. Evans in the south-central part of Webb City, Mo.

Carmean, who lives on a farm three miles west of Carthage, formerly was employed by the Federal Mining and Smelting Company for 25 years, part of which was spent in the Federated Malay States. He left Federal in July, 1943, to become an associate of the Cooley Brothers in the development of the Sucker Flat open-pit mine.

Lawrence Woodworth, mining engineer, has been transferred from the

Cary iron mine, Hurley, Wis., to Ely, Minn., where he is engineer at the Zenith iron mine of Pickands, Mather & Co. He succeeds Russell Balconi who resigned recently.

Professor Lee M. Morris, Head of the Department of Mining and Geology, West Virginia Institute of Technology, Montgomery, W. Va., has resigned effective September 1, 1947, to become Assistant to the President of Warner Colliers Company, Cleveland, Ohio.

To assure that the full talents of its growing staff will continue to be used on each and every industrial problem, Battelle Institute has named six new assistant directors. The new assistant directors—all veteran members of the Battelle staff—are Dr. Frank C. Croxton, Dr. Clarence H. Lorig, Dr. Howard W. Russell, Ralph A. Sherman, Clarence E. Sims, and John D. Sullivan.

Peter Mosier, who recently received his master's degree in mining at the University of Arizona, is now employed as a geologist by the Copper Queen Branch, Phelps Dodge Corporation, Bisbee, Arizona.

Henry F. Hebley, director of research, Pittsburgh Coal Company, is in Poland on special business for the U. S. government.

R. W. Vaughan, associate general counsel of the American Smelting & Refining Co., New York, has been elected a vice president of the company.

Joe Muster, David Dungan, Paul Bizal and Angelo Marinello, longtime employes at the Waubigon Mine of the Hanna Mining company were honored at a party during August at the Danti Alighieri Hall in Buhl, Minn. The men, who worked for the company 42, 30, 20 and 15 years respectively, retired on Aug. 1

Company officials attended the social gathering given by fellow employes.

Randolph W. Hyde has been elected treasurer of Carnegie-Illinois Steel Corporation, succeeding Leon F. Payne, deceased, it was announced

early in August by Oscar N. Lindahl, vice president in charge of finance of this U. S. Steel subsidiary.

Charles F. Hosford, Jr., former chairman of the National Bituminous Coal Commission (1935-38), has been named vice president of the chemical division, Koppers Company, Inc. He is a one-time president of Pennsylvania Coal Products Company and a former president of Butler Consolidated Coal Company, a producing unit he helped to organize.

Donald B. Gillies, vice president of the Republic Steel Corporation, was named president of the Lake Superior Iron Ore Asso-

ciation, it was announced August 28 at Cleveland, Ohio. He succeeds R. C. Allen, vice president of Oglebay, Norton & Company, who had asked to be relieved as president and



Donald B. Gillies

director. His seat on the board is to be filled by H. F. Taylor, of Oglebay Norton. P. D. Block, Jr., of Inland Steel, will succeed C. B. Randall, also of Inland, as a director.

W. D. McElroy has been appointed manager of the development

department,
Research and
Development Division,
Pittsburgh
Consolidation
Coal Company,
Library, Pa.

As manager of the development department, Mr. McElroy will be in charge of all pilot plant opera-



tions in the company's program of coal gasification,

John Wells, superintendent for the Koppers Coal Division at Maitland, W. Va., has been transferred to a new mine of the company at Wharton, W. Va., as general superintendent. E. B. Taylor of the company's Pittsburgh office will replace Mr. Wells at Maitland.

Frank Lilly of Spokane, Wash. has been elected president of Gold Bond Mining Co. He heads Mines Research Bureau which is moving from the Radio Central Bldg. in Spokane to larger quarters in the Ziegler Bldg.



On August 27, Col. James Boyd was sworn in as Director of the U. S. Bureau of Mines. Clarence C. Davison, Acting Chief Clerk of the Department of the Interior, administers the oath while Secretary J. A. Krug looks on

D. J. Pope has been appointed general manager of the Western Mining Department of the American Smelting and Refining Company, with headquarters in Salt Lake City, Utah. For the last year, Pope has served as manager of the same company's Southwestern Mining Division, located at Tucson, Arizona. He has been succeeded at Tucson by A. E. Ring, formerly assistant manager of the Southwestern Mining Division. Pope has been a member of the AS&R staff since 1924, connected with its Mexican mining department during the greater portion of that time.

The Research & Development Division of Pittsburgh Consolidation Coal Company, currently engaged pri-

engaged primarily in the program of coal gasification, has announced the appointment of Dr. D. Leigh Fowler, Jr., manager of its Patent Department.



at Brown University and the Detroit College of Law. He served one year as a research chemist for American Cyanamid, followed by six years in the patent department of Nash-Kelvinator. For the last five years he has been with Corning Glass Works, where he became manager of the patent department.

J. W. Feiss, editor of MINING CONGRESS JOURNAL, has been appointed to the newly created position

of Assistant to the Director of the U.S. Bureau of Mines. and will assume his duties in December of this year. Mr. Feiss has a broad background of mining experience and has ably served the industry as member of the

staff of the American Mining Congress. As assistant to Director James Boyd, he will give special attention to long-range programs of the Bureau of Mines in its work to improve the mineral resource position and aid the mining industry of this country.

this country.

Mr. Feiss' successor as editor of
MINING CONGRESS JOURNAL has not
yet been named.

James L. Bruce, after 22 years of service as General Manager of Cyprus Mines Corporation, has resigned to become Consulting Engineer. He will continue on the Board of Directors as Vice-President. Mr. Bruce has also resigned as President of the subsidiary corporations, Coronado Copper and Zinc Company, and Cia. Minera, Acme, S. A.

Henry T. Mudd has been appointed General Manager of Cyprus Mines and its two subsidiaries. He has been elected a Vice President of Cyprus Mines Corporation and Coronado Copper and Zinc Company and President of Cia. Minera, Acme, S. A.

Roy W. Moore, manager of Coronado Copper and Zinc Co., has been elected president of the company.

Freeman Coal Mining Corporation announces the election of Stuart Colnon as president and Frank Nugent, formerly vice president, as executive vice president of the Freeman organization. Mr. Colnon succeds J. Roy Browning, who resigned the presidency of the Freeman Company to become vice president and labor commissioner of the Illinois Coal Operators Association.

A. R. Reiser, former general superintendent of Park City Consolidated Mines Company's Missouri operation, has been appointed general superintendent of the National Lead Company's MacIntyre Development, at Tahawus, N. Y. Nolan Probst will succeed Reiser at the Missouri operation. Mr. Probst has been with the company for many years in charge of underground mining operations.

Howard E. Lohmann, treasurer of Ayrshire Collieries Corporation, has been re-elected secretary of the Indianapolis Control of the Controllers Institute of America.

— Obituaries —

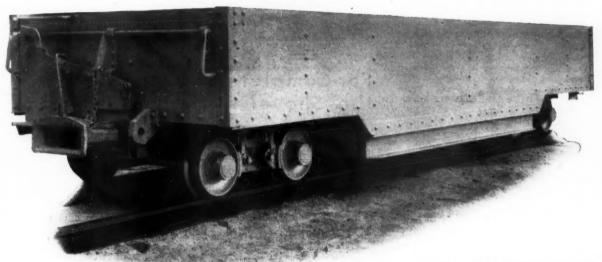
John Lee Rutherford, associated with the coal industry of West Virginia since 1910, died last week at his Charleston, W. Va., home. He developed and was vice president of the Colcord Coal Company, which was later sold to the American Rolling Mill Company in 1942. Mr. Rutherford retired from active business in 1943.

Thomas S. Lowther, 84, retired mining inspector for the Commonwealth of Pennsylvania, died July 19 at his home in Indiana, Pa., following a short illness.

William M. Dorsey, 72, one of the last of early-day prospectors and placer miners in Grant County, New Mexico, who until the day of his death successfully carried on gold placer mining on Bear Creek, died August 7, of a heart attack.

Daniel McFaddon, pioneer Alaskan miner, died recently at his home in Seattle after a lifetime in mining. He was 80 at the time of his death. Born in County Donegal, Ireland, he came to the United States a half century ago. He lived many years in Alaska and had moved to Seattle, only 7 years ago, when he was 73. He was with the Ruby Mines of Alaska for 40 years and was a member of the Alaska Pioneers Association.





A Bethlehem all-steel mine car lasts so long that its cost per year is reduced to a very low figure.

Long life means small yearly amortization. This is the rule with Bethlehem's all-steel mine cars, because steel construction stands up best against the bruising and battering that are routine in coal mining.

Another point: because these cars are able to take a pounding, they spend little time on the sidelines asking for repairs. Hence your shop maintenance facilities need not be extensive.

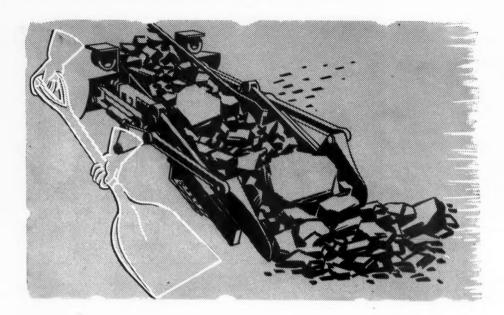
Whether you want end-dump or rotary-dump, high- or lowside types, Bethlehem can build them for you at its modern, wellequipped car shops. We're old hands at this business of making good mine cars—smooth-running, durable four- and eight-wheelers. Late-model Bethlehem mine car, 10-ton capacity. It is equipped with automatic self-centering couplers, roller-bearing trucks, and brakes that are self-equalizing on either curved or tangent track.

This is a rotary-dump type of car.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation





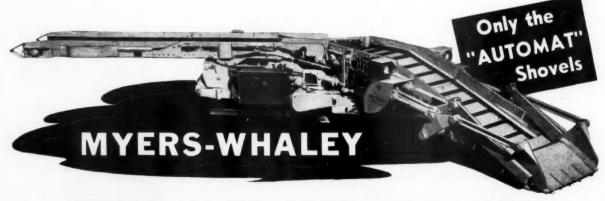
For Complete Service, Choose the Shovel Action "Automat"

For complete loading service in coal, rock or slate, you can't beat the natural shovel action of the Whaley "Automat." Wherever there's loading to be done, the "Automat" handles, in its stride, any lump of coal that will pass through your tipple, or any lump of rock your cars, aerial tram or larries can take.

Having a smooth, swift shovel action, the "Automat" lifts and loads at the rate of 45 to 48 strokes per minute, never failing to clean up quickly, completely and without taking bottom if pavement is soft. With its continuous shovel action, the "Automat" has a rated capacity of 7 tons a minute—easily averages 3 tons per minute.

For complete service, in addition to loading coal, the "Automat" is very effective and efficient in the brushing of entries in thin seams, cleaning up air courses, reopening old workings and making grades.

For complete service, choose the shovel action "Automat". Myers-Whaley Co., Knoxville, Tenn.



MECHANICAL LOADERS EXCLUSIVELY FOR OVER 39 YEARS

NEW Sand WEWS





States

Rockdust to Be Tested

Mine Chief Arch J. Alexander, at Charleston, W. Va., has announced the recent completion of a laboratory in the basement of the Capitol. Its primary purpose is the analysis of rockdust used in West Virginia mines to retard explosions of coal dust and gas or mixtures thereof.

The laboratory was begun in March and completed at an approximate cost of \$45,000. It is well lighted and provided with Orsat gas analysis equipment and a machine for grading and preparing samples of inert rockdust for analysis.

The Mines Department will be enabled to make intelligent rockdust tests and it hopes to have eventually detailed data pertaining to the state's 46 different types of coal seams. It is planned to determine the "flash point" of the dust from various West Virginia coals when in suspension, and applying the proper rockdust to each.

The laboratory will also be of great assistance in checking on samples of air taken from the coal mines by inspectors and the determination of oxygen content as well as deleterious gases.

L. E. YOUNG

Consulting Engineer

Mine Mechanization Mine Management

Oliver Building Pittsburgh, Pa.

Supervision of the laboratory is under the direction of Joseph Bierer of Charleston, administrative assistant to the mines chief.

Coal Research Planned

The anthracite, bituminous and coke industries meeting in July at the Anthracite Institute Building, Wilkes-Barre, Pa., reported satisfactory progress in their research work on problems common to solid fuels.

One phase of the research work is being undertaken in conjunction with the University of Illinois, where the three industries are sponsoring a three-year study on residential planning for the use of solid fuels. A major objective of this research work is to develop house plans with emphasis on basement layouts, integrating fuel storage and handling, ash removal and the arrangement of heating facilities for the most convenient and satisfactory use of solid fuels.

Rudard A. Jones, one of the country's outstanding younger architects and a research associate professor of architecture at the University of Illinois, is in charge of the work. Professor Jones is working on the architectural aspects of using solid fuel in the home, studying first the most effective application of existing solid fuel-burning equipment and accessories. Tied in with this work will be studies on the design and location of coal bins, combination coal delivery and ash-removal window, ash set-out basement construction, areaways, chimney location, dustless handling of fuel and ash and heating plant layout.

As the research work progresses new ideas for the use of solid fuel in the home will be studied. This study will include a survey of home trends and the means of conforming solid fuel use to such trends.

Coordinated with the University of Illinois work will be a research program aimed at developing new and more efficient methods for the handling of solid fuels and ash. Engineering personnel has been engaged by the anthracite, bituminous and coke industries and work will be conducted in the Anthracite Institute Laboratory with activities starting immediately.

A joint technical committee of the three industries has been set up by Anthracite Institute, Bituminous Coal Research, Inc., and the American Coke and Coal Chemicals Institute to initiate and supervise all research work on matters of mutual interest. The pooling of the research facilities of the three industries, plus residential planning and research facilities of the University of Illinois should lead to a faster solution of the problems attendant to the handling of solid fuels and ash than would be possible through individual industry research.

The Search for Strategic Minerals

The U. S. Bureau of Mines said it will conduct 35 explorations for strategic metals and minerals on the nation's scarcity list.

Lowell B. Moon, chief of the bureau mining branch, recently stated that the search in 19 states and Alaska will center on about eight commodity groups listed by the Army-Navy Munitions Board as facing critical shortages.

"We'll go after lead deposits harder than anything else," Mr. Moon said. Other commodities include tin, copper, iron, mercury, beryllium-tantalum and tungsten.

New Stripping Safety Cable

A new type of shielded trailing cable, protective panels, and specially designed ground relay devices to protect workers handling the high-voltage lines supplying the electrically-operated digging equipment, has been introduced at the Saddle Creek phosphate mine of American Cyanamid Company in Florida.

The newly-installed trailing cable carries electric power in excess of 4,000 volts from the main power line to the electrically-operated draglines which dig out the phosphate pebble rock for ultimate use as a fertilizer product. The jacketed cable, known as Geoprene, is manufactured especially for use with heavy, portable machinery. Normally black in color, its jacket will be changed to red at the suggestion of Cyanamid safety engineers, who believe the red jacket will continually remind employes to use caution on the job.

Each conductor of the three-wire cable is covered with a metal sheath woven around the outside of the individual insulation. Each sheath is in contact with the sheath on the other two wires, and ground wires are set in the spaces between each metal sheath and in contact with them. The entire cable is covered with the tough Geoprene insulation which is famous for withstanding hard usage.

In the event of a break or "fault" in any part of this cable, the highvoltage current would be carried im-



This reel contains the new three-wire cable

mediately by the metal sheathing or the ground wires or both to a protective panel located between the trailing cable and the main power line. This current would energize an ingenious ground relay device which would trip the main switch and cut off the power to the entire cable. The amount of electricity allowed to escape through the outer insulation of the cable is regulated carefully to limit potential to ground to a value of between 60 and 100 volts, enough to give warning of danger to the employe who touches it, but not enough to cause shock or injury.

The importance of this installation as a safety measure can be appreciated in view of the fact that the highvoltage cable supplying power to a portable dragline is handled constantly by employes who drag it about as the digging equipment moves from place to place. The cable is hauled along on the ground over sharp rocks and abrasive sand and gravel. In Florida it is exposed to intense heat from the sun, and particularly in the phosphate mining fields, where water under pressure is used to break up the rock-bearing clay matrix, the cable is wet a good part of the time.

-MINE SHAFT HOIST

Ilgner Ward-Leonard Shaft Hoisting Equipment. Vulcan No. 822 Hoist, Double Drum, Hoisting Height 280', 13'8" rope, rope full speed 2,000 FPM, 200 trips per hour. Capacity is cage and car weighing 15,000 lbs. and weight load of 5,000 lbs.

This unit is complete with 475 HP direct connected DC motor; MG set 350 HP, 6,600 V., 3 Ph., 60 Cy. Wound Rotor Motor direct connected to fly-wheel and 400 KW DC Generator. Control panel with primary and secondary control of motor and DC control for generator and DC Hoist Motor.

ISLAND CREEK COAL COMPANY
Purchasing Department
Holden, West Virginia

Labrador Iron Potential

The huge new iron ore fields in Labrador and Quebec, in which the M. A. Hanna Co. of Cleveland holds an important though minority interest, have an indicated value already of at least a billion dollars, according to recent reports.

The new ranges, which have been controlled since 1942 by Hollinger Consolidated Gold Mines, Ltd., of Montreal, have been providing ore and steel circles along the Great Lakes with a lively topic of conversation.

Canadian publications, which have printed almost the only news so far about the new ranges, have said the Hollinger interests would not go ahead with actual mining until they were sure of potential supplies of at least 300,000,000 tons of high-grade

This figure is comparatively small beside the more than a billion tons estimated to be left in the Mesabi diggings. But the Canadian deposits have been only partly explored.

Moreover, geologists' reports in

1945 showed the Canadian ore assayed 62.1 per cent iron in Labrador and 61.2 per cent in Quebec. The Mesabi ores, which are classified as "good," assay around 50 per cent.

The Canadian deposits, first noted in 1893, are 300 miles north of the Gulf of St. Lawrence and 700 miles northeast of Montreal, on the border of Labrador.

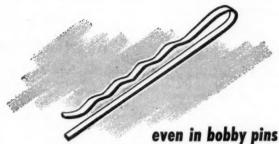
The Hollinger interests, through a subsidiary, the Labrador Mining & Exploration Co., have been granted the right to explore 20,000 square miles in Labrador, with the provision that only 2,000 square miles may be worked after 1953.

Another subsidiary, the Hollinger North Shore Exploration Co., is working in a much smaller area in adjoining Quebec. Jules R. Timmins of Montreal heads the Hollinger interests.

By the end of this year an initial investment estimated at \$1,170,000 will have been spent in examining ore deposits.

Despite the need for the Canadian ore, however, up to 15 years are ex-

STEEL IS CHEAP!



\$6400.00 PER TON

Across the 5 & 10 counter, steel bobby pins cost only a dime for 30-cheap, aren't they, considering the service they perform?

On the tonnage basis, those bobby pins cost you \$6400.00 as against \$190.00 per ton for the wire from which bobby pins are made.

This illustrates in a striking manner the small amount which the cost of steel plays in the ultimate cost of steel products. Including the recently announced increases, steel has advanced only about ½c per pound over the last 10 years. This is not important from an inflationary standpoint. Steel IS Cheap.

The average price of steel as obtained by the mills is a little over 3c per pound—about \$60 per ton (based on weighted production of 9 major steel mill items, representing a substantial percentage of steel production in the United States.) Steel items like grinding media are higher than the composite price of steel because of the special processing, finishing and heat treating operations they must go through.

TRADEMARK REG

Grinding Balls

SHEFFIELD STEEL CORPORATION KANSAS CITY TULSA

Carbon & Alloy Steel, Ingots, Blooms,
Billets, Plates, Sheets, Merchant
Bars, Steel Joists, Structural
Shapes, Road Guard
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Welded Wire Mesh, Wire Products,
Wire Rods, Fence, Spring Wire,
Nails, Rivets, Grinding Media,
Forgings, Track Spikes,
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San Antonio, Tex.; New Orleans, La.

pected to elapse before any sizable amounts reach consuming points.

Total expenditures in preparing the deposits for market are expected to reach \$100,000,000. Included will be a 350-mile railroad, dockage and loading facilities, mills and towns in the wilderness. Employment will be provided for at least 2,500 men.

New Entry to Island Creek No. 3

Near Holden, W. Va., men with road grading equipment are working on a road at a point west of Shamrock on the Logan-Holden road, for the purpose of opening up a part of the coal area of the old Mine No. 3 workings of the Island Creek Coal Co. The original entry to No. 3 was on the Whitman Creek. For a time the coal will be hauled to railroad loading point by truck.

A Fine Safety Record

The annual safety picnic, for the supervisory force of Pond Creek Pocahontas Company was held August 10 at the Bartley Park at Bartley, W. Va. Preceding the picnic, a meeting for safety talks and a discussion of the accident performance for the first six months of 1947, as compared with the first six months of 1946 and previous performances, was held at the community building.

A. J. Bartlett, director of safety and master of ceremonies, opened the meeting, and Fred Scammell, safety inspector, presented the high points of the analysis of the accident performance for the first six months of this year compared with the same period

The record showed 33 lost time accidents for all mines during the first half of 1947 and 36 for the first six months of 1946, or a decrease of three. Tonnage per lost time accident for the first half of 1947 was 29,588 as compared with 21,087 in the same period of 1946, an increase of 8,501 tons per lost time accident.

No fatality occurred during the first half of 1947. Man days lost on account of accidents for that period were 1,719 compared with 14,377 in the same 1946 period.

Brief, interesting talks on safety were made by W. D. Combs, Walter DeBord, Joe Skiba and C. E. Walker. Mr. Walker, general manager, congratulated the supervisory force for their splendid accident performance record and for continued improvement. He named as their goal no fatalities for the entire year.

Thirty-four foremen were cited for not having a lost time accident for the first six months of 1947.

Pilot Plants to Remain Open

The U. S. Bureau of Mines has decided to keep open most of the pilot plants it had suggested closing for lack of funds.

O. C. Ralston, chief of the Bureau's metallurgical branch, recently stated that operations at the pilot plants and experiment stations will be spread "thinner and wider" in accordance with congressional orders accompanying a 37 per cent cut in funds and a 30 per cent cut in personnel.

Dr. R. R. Sayers, former director of the Bureau, informed Secretary of the Interior Krug last May that he had alerted his field staff to prepare for the following closings:

The electrolytic manganese pilot plant at Boulder City, Nev.; the bauxite beneficiation mill at Bauxite, Ark.; the Rotary Kiln Sponge iron pilot plant and laboratory at Laramie, Wyo.; the lignite gasification pilot plant at Grand Forks, N. Dak.; zinc dithianate, vanadium and antimony plants at Salt Lake City.

In addition, Sayers advised Krug, construction was to be halted on a zirconium pilot plant at Albany, Oreg., and studies were to be abandoned on iron ore beneficiation at Tuscaloosa, Ala.

The Bauxite, Laramie, Grand Forks and Salt Lake City plants also will remain in operation but on a reduced basis—so greatly reduced that the Laramie plant for example, may be unable to function for more than two or three months out of the year.

A Fine Mining Record

The history of the Cuban-American Manganese Corp., which was recently dissolved, and the proposed liquidation of Cuban Mining Co., were discussed in a recent report signed by Langbourne M. Williams, Jr., president, who stated:

"The record of Cuban-American Manganese Corporation and Cuban Mining Company is one in which we take a great deal of pride. From the start of operations in 1932 through the final period in 1946, 1,500,000 tons of manganese were supplied to the United States. Cuban-American Manganese Corporation's stockholders received in ordinary dividends and in the liquidating dividend the amount of their cash investment of \$3,090,000 plus \$5,290,288 and the stock of Cuban Mining Company.

"To summarize the results, the undertaking supplied the American steel industry with very substantial amounts of a highly strategic material, it earned stockholders a reasonable profit, and it provided jobs for American engineers and Cuban work-

ers, a market for suppliers of materials and equipment, and tax revenues for the United States and Cuban Governments. These accomplishments in the face of unusual difficulties were due in large measure to the energy, perseverance, and ingenuity of our technical and administrative staff, under the leadership of the general manager, Fred S. Norcross, Jr. Their loyal and effective efforts deserve our highest admiration and appreciation."

Safety Picnic Well Attended

Over 400 attended the annual picnic of the Ebensburg Council of the Joseph A. Holmes Safety Association, August 16 at Nicktown, Pa. Representatives were present from the federal and state mining bureaus, the coal companies and the United Mine Workers of America in the council area. During a business session, the council adopted as its objective "To make the mines of Pennsylvania the safest in the world." This marks the beginning of a program to increase the safety consciousness of the industry in the district. The Anthracite Octette of Lansford provided an excellent program of vocal music. Es-

pecially appreciated by the audience were the miners' songs and dialect ditties telling of the woes of the Welsh miner. The octette is composed of Jack, Ed and Al Pascoe and Norman Richards of Coaldale; Albert Morgan and Oscar Wherle of Tamaqua; Brindley Richards of Lansford and Bob Baskin of Drifton. The group is affiliated with the Lehigh Coal & Navigation Co.

TVA to Look for Barite

Tennessee Valley Authority and the states of North and South Carolina are cooperating realistically in an inventory survey of the Kings Mountain Geologic District which started July 1, according to announcement by Dr. Jasper L. Stuckey, North Carolina state geologist and head of the minerals resource division of the North Carolina Department of Conservation and Development.

Main object of the cooperative explorations extending through September, 1947, will be deposits of barite, although some score of other minerals known to exist in commercial quantities in the area will be inventoried.



Central



States

Largest Coal Mine Planned for Illinois

Peabody Coal Company is starting developmental work immediately on a new mine in Christian County, Illinois, that is designed to be the most productive in Illinois and the most modern in the country, according to George W. Reed, Peabody vice president.

The mine is to be known as Peabody No. 10, and will be constructed at an estimated cost of \$10 million. It will have a daily production capacity of 10,500 tons. A contemplated two-shift work schedule will enable the pit to double the daily output of the state's present largest producer. Reed said the company expects to have the mine in full operation within 18 to 24 months.

Located about 15 miles west of Taylorville, Ill., the mine will supply coal to the Commonwealth Edison utilities companies, with which Peabody has a contract extending through 1958. Reed said that Peabody has had to abandon five mines in the past six years and this loss in production, coupled with a substantially increased demand from the Commonwealth Edison utilities, led to the decision to open a new mine. He estimated that nearly 130 million tons of coal can be recovered from the new mining site. The coal is about 450 ft. below the surface and will be blasted with compressed air pumped from the surface. The mine will be fully mechanized, employing mechanical loaders, shuttle cars and mine cars equipped with swivel couplings for underground haulage. Coal will be dumped from the cars into skip hoists on the mining level. According to Reed, Peabody No. 10 will be the first new mine in which all these modern methods and devices are incorporated.

Hanna-Evergreen Merger

The M. A. Hanna Company has announced that Evergreen Mines Company of Crosby, Minn., in which Hanna acquired a substantial stock interest about two and a half years ago, has been merged into Hanna Coal & Ore Corporation, operating subsidiary for its iron ore, docks, vessel, and lake coal business.

The merger was approved by all of the stockholders of both Hanna Coal & Ore Corporation and Evergreen Mines Company, it was announced. For the past two years the Evergreen Company, owning a group of iron and

manganiferous ore mines on the Cuyuna and Mesabi ranges, and distributing some 3,000,000 tons of ore annually, has been operated by The M. A. Hanna Company as agent.

Perry G. Harrison, president of Evergreen, becomes vice president of Hanna Coal & Ore Corporation and continues as ore sales manager of The M. A. Hanna Company.

Hull-Nelson Conveyor Operating

The Oliver Iron Mining Co. has commenced operation of its 1,500-ft. conveyor belt serving the Hull-Nelson iron ore property at Eveleth, Minn., on the Mesabi iron range. Most of the belt is underground, with the discharge end emerging from underground and delivering ore to a pocket, which in turn loads railroad cars below.

The Hull-Nelson belt is supplied with ore by trucks which dump into a

pocket in the pit floor to the belt below ground. The ore is screened and crushed in the pit ore pocket preparatory to the belt.

The equipment on the Hull-Nelson conveyor was formerly used on the Spruce mine conveyor, also at Eveleth, and was transferred in part to a new site at the Hull-Nelson operation. The original Spruce belt was the longest conveyor system on the Mesabi range, 4,500 ft. in length. It also had the highest vertical lift, 428 ft.

Dewatering Michigan Mine

The Hanna Iron Ore Co., is dewatering the Bengal-Tully underground iron ore property at Stambaugh, Mich., on the Menominee iron range. As soon as the dewatering is completed a campaign of exploration and development will follow.

On-Shift Shooting Banned

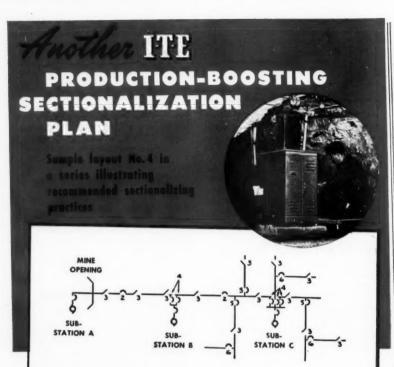
The Illinois legislature has enacted legislation banning on-shift shooting in Illinois coal mines. The Governor has also approved a bill banning solicitation of political campaign funds by State Mines and Minerals Department employes, including mine inspectors.



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 I-T-E Type KSC Circuit Breaker installed in circuit between each two substations.

 A disconnect switch or protective device placed at not over 1500 foot intervals in every power line.

 I-T-E Type KSA Circuit Breaker (tripfree operating mechanism)—used as overcurrent protective device in each circuit leaving a substation.

each circuit leaving a substation.
5. I-T-E Type KSC Circuit Breaker—

Key

installed as overcurrent protective device at each main branch circuit.

 I-T-E Type KSC Circuit Breaker—to protect secondary branch circuits (i. e. a circuit feeding only one local section or territory).

Note: In every case, sufficient feeder and return circuit capacity should be provided so that circuit breaker will be opened by a dead short at the most remote point of the circuit.

When electrical distribution systems are sectionalized with I-T-E Sectionalizing Switchgear, production levels are raised: time lost because of electrical disturbance is kept to a minimum, and safety to personnel and equipment is assured.

In the above application, the heart of protection is the I-T-E Type KSC Automatic Reclosing Circuit Breaker. The only circuit breaker designed especially for the mining industry, the KSC has ample flexibility for meeting changing mine conditions. Completely dependable, it is durable and efficient under the most severe operating demands. Rugged and compact for easy portability, it is also completely metal-enclosed for safety—yet readily accessible for inspections and maintenance.

The I-T-E representative in your locality can give you complete information on the I-T-E Type KSC Automatic Reclosing Circuit Breaker. He is also fully qualified to assist you in the adoption of recommended sectionalizing practices in your mine. Use his services with no obligation.

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1-T-S CIRCUIT BREAKER COMPANY, 19th & HAMILTON STS., PHILA 30, PA. 31 OFFICES IN U.S. & CAHADA SWITCHGEAR . UNIT SUBSTATIONS . AUTOMATIC RECLOSING CIRCUIT BREAKERS

Tri-State Production Cut

More than half of the zinc and lead mines in the Missouri-Kansas-Oklahoma area have closed since President Truman vetoed a bill to extend subsidy payments to producers of these metals on August 8.

Preliminary reports showed these mines closed: Federal Mining Co.'s mines at Granby and Picher, employing 200 men; Evans-Wallower Mines at Cardin, employing 100 men; Kansas Exploration Mines, employing 150 men, and 21 mines of Eagle Picher Mining Co., employing about 500.

All told there were 6,000 miners working in mines in this area before premium payments were cut off. Now there are less than 3,000. Further shutdowns are expected. Output has been cut 60 per cent to 70 per cent since early in August.

New Job for Mine Shovel

Another old mine shovel which has made history is leaving the Mesabi range in Minnesota.

Coming closely on the announcement that "old No. 3" of the Oliver Iron Mining Company has been disposed of to a dredging company in the east is the information that No. 10701 which was the first electric shovel purchased by Butler Brothers in 1931 was recently sold.

It was set up at the North Harrison mine but saw service in most of the properties of Butler Brothers. No. 10701 has been shipped to a concern at Richard Spur, Okla.

Like "old No. 3" it brought back many fond memories to the men who operated the shovels which get out the iron ore.

Two New Iron Mines Started

One iron mine project was started in the Spring Valley, Minn., area recently and preparations for another one are under way.

Newly started were mining operations four and one-half miles south of Spring Valley and a half mile from Highway 63 near Ostrander. Directing the operations are two Hibbing men: Leo Kreuz, superintendent and James Meli, engineer and 15 men employed in mining while 30 are employed by the Woodrich Construction Co., Minneapolis.

In use are six-ton trucks and three 12-ton trucks and in addition to machinery there is a quonset used as an administration building, including a

shop and warehouse.

Located near the Root River is a pump house. The company has graded a road to connect with Highway 63 and also has constructed a 27-ft. concrete pier bridge which can bear loads up to 20 tons.

Ore is trucked two and one-half

miles around Ostrander to loading platforms on the Chicago Great Western tracks from which it is shipped to Granite City, Ill.

Personnel Changes at Jenkins, Ky.

Consolidation Coal Company of Kentucky has announced the following changes in its staff:

Paul Jessee, who has worked as lineman and assistant line foreman in the Power department for many years, has been promoted to line foreman, replacing P. S. Wheeler, retired.

Clyde A. Milsap of Clover Splint Mine, who has been working as wireman during the past few months, has been made section foreman.

J. W. Necessary, Bruce Phelps, Marvin Akers, John O'Bryan, and Arthur McCoart, all of Mine 155, have been advanced to section foremen. These men have a combined period of service of 60 years and have worked at just about every occupation existing in the mine.

Worley Mace, for several years Joy operator at Mine 214, has been promoted to section foreman.

Palmer Scott, for several years Joy operator at Mine 207, has been promoted to section foreman.

Theodore Hensley, coal loader, and Lafayette Cox, main line trackman, Clover Splint Mine, have been promoted to mine examiners.

Students Visit Iron Ranges

Thirty-two mining engineering students of Michigan College of Mining and Technology, Houghton, were in Duluth and on the Mesabi and Vermilion ranges during July and August for an inspection tour of northern Minnesota mining and industrial operations

The itinerary included the Duluth, Missabe & Iron Range Railway Co. docks, Two Harbors, surface and underground mining at the mines on the Vermilion range, Pioneer, Zenith and Soudan, and study of open-pit mining on the Mesabi range.

Prof. J. Murray Riddell, head of the college's mining engineering department, headed the tour.

For Sale-

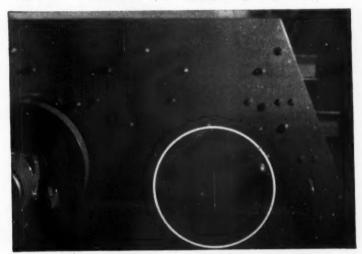
Woodford electrical Third Rail Standard Gauge Haulage System including 3 generators and control equipment, 2 car dumps, 44 Kilbourne and Jacobs 15-ton quarry cars with motors, 37 extra car motors, miscellaneous appurtenances and repair parts. Location: Alpena, Michigan.

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... with a SECO Vibrating Screen

• Contrast the drawing above with the unretouched photo of a Seco vibrating screen moving at 1050 R. P. M. Here is conclusive proof (note the pencil and washer on the base frame are unshaken) that Seco keeps all of the vibration in the live body...where it belongs. Note also, if you have a magnifying glass, that there are many little circles visible on the side plates. These indicate that the screen's motion is in true circles, with no distortion. No wonder operators everywhere report increased tonnages on all types of screening jobs with these dependable Seco vibrating screens. Write for "A Guide to Better Screening." Dept. B

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Industries engaged in the packing or processing of farm products find Nebraska a rich source of raw materials. Corn, grains, sugar beets, potatoes and other vegetables are grown in abundance.

Omaha is a leading meat packing and poultry processing center. It frequently leads the nation in livestock receipts, is located in the world's largest butter producing area, and houses the nation's second largest industrial alcohol plant.

In addition to agricultural activity, there is diversified industrial manufacturing

such as farm machinery, air conditioning equipment, fabricated steel, brick and tile.

Nebraska has large mineral deposits; gypsum, salt, potash, sand, gravel, stone, etc. Natural gas, petroleum and coal are readily available.

Of particular interest to industry is Nebraska's "pay-as-you-go" policy; no state sales, income or luxury taxes. It is a good place to work and live.

In Omaha are the headquarters of the Union Pacific Railroad which provides efficient, dependable transportation for shippers and travelers.



* Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.

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THE STRATEGIC MIDDLE ROUTE

Western



States

Montana Miners Meet

Over four hundred delegates and guests from throughout Montana's mining districts and a number of mining men from other western states, attended the Ninth Annual Summer Convention of the Mining Association of Montana at Butte, August 3 and 4.

The convention was opened by Dr. H. L. Casebeer, prominent Butte physician and president of the Butte Chamber of Commerce, who gave the address of welcome. Al V. Taylor, Jr., president of the Mining Association of Montana, responded. Evan Just, editor of Engineering and Mining Journal, then spoke on "High-lights on the Mining Outlook," covering urgent operating and economic questions, such as manpower, public and industrial relations, state mining associations and premium prices for metals. Robert L. Ziegfield, New York City, recently elected secretary of the Lead Industries Association, gave figures and predictions on "The Future of Lead." Following these speakers, an open forum discussion took place on "Montana Industrial Accident Insurance." The forum was presided over by Howard A. Johnson of Butte, until recently Chief Justice of the Montana Supreme Court.

At a second business session the following day, Harry J. Evans, vice president of the Elkhorn-Beaverhead Mines, Inc., and formerly mineral specialist for the U.S. Foreign Economic Administration, gave a highly interesting talk on "Foreign Strategic Minerals." Charles E. Schwab, of Charles E. Schwab, of Bunker Hill and Sullivan Mining and Concentrating Co., Kellogg, Idaho, then spoke on group insurance and sickness benefit plans. He was fol-lowed by Herbert A. Sawin, San Francisco, engineer with the Yuba Manufacturing Co., who addressed the convention on "The Future of This session closed Gold Mining." with a report of the Resolutions Committee which is given in detail in the August issue of the "News Letter" of the Mining Association of Montana.

The meeting closed on August 4 with the annual banquet and informal dance at the Finlen Hotel. The guest speaker for the evening was R. W. Diamond, vice president and general manager of the Consolidated Mining & Smelting Co., Ltd., Trail, British Columbia. This banquet was a joint affair sponsored by the Mining Association of Montana and the Columbia, Coeur d'Alene and Montana sec-

tions of the A. I. M. E. Carl J. Trauerman, secretary of the Mining Association of Montana, reported that the demand for banquet tickets was so great that seating capacity of the hall was not sufficient for the crowd.

Telluride Tunnel Advances

The development program of the Telluride Mines, Inc., includes the driving of the Mill Level tunnel which will open the property some 1,000 ft. below present workings, provide a new main haulageway, and serve as a center from which to develop all of the ore bodies controlled by the company.

Telluride Mines, formerly Veta Mines, Inc., is located near the town of Telluride, Colo., in the San Juan triangle. H. S. Worcester is president and general manager of the company.

The ultimate length of the new 8½x9 ft. adit of the tunnel will depend upon conditions revealed in the course of the driving. The heading is now some 1,500 ft. from the portal and it is expected that soon it will be advancing at the rate of 30 ft. a day.

Tombstone Mill Operating

Operations, Inc., Tombstone, Ariz., placed its new 100-ton flotation mill in operation early in August. Initially two shifts are employed in the mill, but plans call for 24-hour operation at an early date. This company is working the San Juan mine leased from Jonathan Gordon of Tombstone and has stepped up mine production to meet mill demands.

California Property to Build Mill

Large gold deposits have been developed in a property near Quail Lake by Lake Tahoe Gold Mining Co., according to London L. Noonchester, of Auburn, Calif., principal owner of the corporation. He states the ore zone has been opened by approximately 100 open cuts and 400 ft. of tunnel; that extensive reserves have been exposed, and that the company is negotiating for the first unit of a mill designed to handle 150 tons of ore daily.

Noonchester reports the company has spent \$300,000 on development of the property and plans to mill 1,000

tons of ore a day and employ 300 men in less than five years. Dumps are said to contain excellent ore values. A vein discovered lately at surface is said to be approximately 100 ft. wide with some ore samples assaying as high as \$53 a ton. Noon-chester says 20 men are employed at the present time.

Flotation will be used for gold extraction in the projected mill. Noon-chester reports that tests conducted at laboratories in Oakland, Sacramento and Reno indicate that the ore can be mined and milled at a cost not exceeding \$3.50 a ton. It is planned to work the ore bodies in open cuts on a large scale, probably with power shovels.

A New Wyoming Placer Project

Extensive placer mining activities along the North Platte River, about 25 miles southwest of Casper, Wyo., are in the making with the receipt of dredging equipment which has been taken to the site. The Nevada-Wyoming Mines Co. and the Great Western Mining & Development Co. have established offices in Casper at 542 S. Durbin Street, it was learned from H. P. Waite, president of both companies.

The Nevada-Wyoming Mines Co. owns three placer mines along the

DIG and HAUL



Picture shows how a Sauerman Power Scraper at nickel mine in Canada digs into hill and moves material down to a reise to backfill a worked out stope.

You can move any loose materials—coal, ore, sand, gravel, clay—fast and efficiently with a Sauerman Power Scraper. One man handles the entire operation through simple automatic controls. Operating range is easily extended. Sturdily built for long, low-cost service. Electric, gasoline, Diesel or steam power.

SAUERMAN BROS., Inc.



Platte. The Great Western Mining & Development Co., a Wyoming corporation, owns the Golden Rim mine, which is part placer and part hard rock, in southwestern Park County adjacent to Yellowstone National Park.

Mr. Waite said five carloads of equipment had been received at Casper, of which a pilot dredge is the principal unit. This has been taken to the area southwest of the town and is being set up. The dredge has a capacity of 3,150 cu. yds. per 24-hour day. When in full operation it will be operated with three shifts and five men per shift will be employed.

Considerable acreage is under lease or option in the area where the mining operations will be conducted. It was stated that the Great Western Mining & Development Co., which is a holding corporation, expects to spend three or four million dollars in Wyoming within the next four or five years.

Production Expected from Utah Property

Mining operation got under way recently on the Beaver Basin coppersilver property in the North La Salle Mountains, not far from Moab, Utah. Fennol Sitton, of Dove Creek, Colo., has acquired the group of claims and plans to commence the early shipment of ore. Previously a crew of men went up to the mines, taking an air compressor along. It is understood a considerable tonnage of ore has been blocked out and early production is expected.

Metaline Drilling Favorable

Favorable formation has been found in two 1,000-ft. diamond drill holes put down by Sullivan Mining Co., southwest of the American Zinc properties, it is reported recently from Metaline Falls., Wash. The ground is under lease from Metaline & Pine Creek Cons. Mining.

Plant Purchased for Nevada Placer

Purchase of a washing unit, power engine, screens and tractor for operations at its Leonard Creek gold placers has been announced at Winnemucca, Nev., by Eureka Hamburg Mining Co. of California. The washing plant will be installed on a deposit said to sample \$2 to \$36 per cubic yard, and the equipment is expected to handle 400 cu. yds. of material daily. Situated in a noted mineral region 100 miles northwest of Winnemucca, the Leonard Creek placers are said to have been enriched by gold eroded from the quartz veins in the adjoining Pine Forest district.



Left: The site of Montana's first hotel at Bannack

Below: The dedication ceremonies attracted a crowd from throughout southwestern Mon-

Montana's Original Capital

On July 27, at Bannack, Mont., there took place a dedication ceremony, part of a program designed to restore the original capital of Montana Territory. The old ghost town of Bannack, located on the Lewis and Clark trail, first became an important gold camp in 1862. From 1864 through 1865 the town was the capital of Montana.

In 1917 a fire destroyed many of the old buildings but a number of the original buildings still remain and it is planned to restore and rebuild as much of the town as is practical. At one time the Bannack area was an important gold producing region in Montana. The old Graeter mill of the Bannack Apex Mining Company is located about a mile from the town and there is an extensive placer ground surrounding the town site.

The dedication ceremonies were well attended and Carl J. Trauerman, secretary, Mining Association of Montana, was the guest speaker.

A Nevada Beryllium Find

Discovery that two beryllium deposits near Searchlight, Nev., will possibly yield large quantities of beryllium, was announced recently by Edward J. Hawkins, mining engineer of Las Vegas. The amount of beryllium discovered is still considered problematical. Assays indicate 1.1 per cent beryllium in the ore.

Hawkins said that with the help of Jim Henry, veteran Searchlight prospector, he discovered the beryllium ore in two pipes or cones last April. He said he had been seeking mica.

Arizona Mine to Reopen

A crew of 22 men has been employed, under the direction of Jay Bateman of Oracle, Ariz., to reopen the Bluebird mine in Pinal County. This property, owned by a Michigan company, is situated on the Copper Creek Road to the San Pedro River

and Mammoth and has been developed on seven levels with approximately 1,000 ft. of development work on each level. The narrow fissure vein on the three upper levels was stoped during previous operations which date back to the 1860's. The mine equipment includes a 50-ton mill, power plant and miscellaneous machinery.

Tunnel Completed at Berlin Mines

The first phase of an extensive development program of the Berlin mines, in northern Nye County, Nevada, has been completed by the connection of the new 860-ft. Diana tunnel with the fourth level of the old workings. The mine was formerly worked through an incline shaft to the eighth level. Exploratory work is now under way through drifts and raises on the first and fourth levels. The Berlin mines are owned by The Nevada Company, a New York corporation.

Santa Rita to Expand

Major expansion of mining operations by Chino Mines Division, Kennecott Copper Corporation, at Santa Rita, Grant County, N. Mex., has been announced by Horace Moses, general manager.

The Santa Rita pit, one of the largest in the United States, ranking with Utah Copper Company at Bingham, and Phelps Dodge Corporation at Morenci, Ariz., had its beginning early in the 18th century when Spanish soldiers first mined copper in Southwest New Mexico.

The official announcement of the enlargement of the pit at Santa Rita, made by Moses, was as follows:

"Kennecott Copper Corporation has awarded a contract to the Isbell Construction Co. of Reno, Nev., for the removal of several million tons of overburden and the preparation of the east side of the Santa Rita pit for the establishment of mining benches looking towards the extension of the pit. Preparatory work is now under way and the moving of material should start in the next 30 or 60 days."

Mr. Moses pointed out that the enlargement of the huge pit would in no

way disturb the historic "Kneeling Nun," a natural shrine atop a mountain adjoining the pit, that for 141 years has withstood the elements.

Hank Noels, project engineer for the Isbell Construction Co., is already at Santa Rita making preliminary surveys and setting up equipment for the tremendous earth-moving job.

A. S. & R. Operating New Mexico Property

The American Smelting and Refining Co. is carrying on a productive lead-zinc mining and milling operation at the Graphic Waldo mine formerly owned by the Ozark Smelting and Mining Co. The property is located in the Magdalena-Kelly District, Socorro County, New Mexico. Early-day mining dates back to 1866, when the original discovery opened up deposits of oxidized lead ore that was smelted in an adobe furnace and the lead bullion shipped to Kansas City, Mo. Operations are under the direction of L. H. Chapman, unit superintendent; G. J. Matthews, mine superintendent; B. L. Rickman, mill superintendent; J. S. Desvaux, chief engineer.

Day Companies to Merge

Detailed plans for consolidation of Day mining interests into one company, to be known as Day Mines, Inc., are outlined in a proxy statement recently mailed to the approximately 4,000 stockholders of the various companies.

If the consolidation plans are accepted by the stockholders at meetings called for September 23 and 24, then Day Mines, Inc., will be a company owning 636 patented and 97 unpatented claims, in addition to ten portions of claims. The patented ground would total 8,685 acres. In addition, two subsidiaries of Day Mines, Inc., would own 73 patented claims and 20 patented lots, comprising 1,193.18 acres, and 83 unpatented claims.

Ore reserves of the company, as of December 31, 1946, would total 914,-684 tons. The new company would have five mills with a total daily capacity of 1,320 tons, and at present the five principal companies that would be consolidated employ 336 men.

The companies to be consolidated include Tamarack & Custer Consolidated Mining Co., Hercules Mining Co., Sherman Lead Co., Dayrock Mining Co., Monitor Mining Co., King Mining Co., Stanley Mining Co., Du-



Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS
WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY

PARIS, ILLINOIS

luth Mining Co., Happy Day Mining Co., Ltd., Western Union Mining Co., Crystal Lead Mines Co., and Treasure Vault Mining Co.

All these companies are located in the Coeur d'Alene mining district, as is the Fern Mining Co., one of the subsidiaries. The other subsidiary, the Aurum Mining Co., has its gold holdings near Republic, Wash.

The five principal operating companies, the Tamarack & Custer, Dayrock, Sherman, Monitor and Hercules, own complete surface plants in addition to mills.

West Coast Zinc Plant Begins Operations

Federated Metals Division, American Smelting and Refining Co., recently put into full operation at Los Angeles, Calif., its new plant for production of intermediate zinc. This facility, a part of the Federated modernization program, was added to round out Federated service to its West Coast customers. With zinc plants at Beckemeyer, Ill., in the Midwest, and Trenton, N. J., in the East, Federated is now able to provide production and distribution coverage for this product from coast to coast.

The plant, constructed at a cost of nearly \$200,000, includes the latest handling equipment as well as improved smelting furnaces which use horizontal type retorts. A feature of the process is the palletizing of the zinc slabs for customer convenience by casting specially shaped slabs for the bottom pieces.

To Strip Perlite Deposit

A mountain of volcanic glass is located about three miles south of Maupin in central Oregon. Work on the Lady Frances Mine, believed to be the only underground perlite workings in the world, was begun in August, 1945, by Dant & Russell, one of the West's largest lumber exporters and importers and sales agents for wallboard insulation.

Into this mountain, the operators have run almost 2,000 ft. of tunnels. This was done primarily to determine the extent of the deposit. Now that it has been determined that the mountain contains approximately 20 years' supply of perlite ore, the operation of the deposit will be converted to strip mining.

The raw ore is crushed, ground and screened at the mine and shipped by rail to Dant & Russell's plant at St. Helens, Oreg., where it is popped by 2,500 degree F. furnace heat into the little glass globules which compose the finished product.

Lucky Friday Pays Its Way



The portal of the Lucky Friday is flanked by the compressor and machine shop

Lucky Friday Silver-Lead Mining Co., at Mullan, Idaho, is now in steady production after developing a mine on its own power from the surface to the 1,400 ft. level. In the prospecting operation the company paused on every 200-ft. level and developed the vein sufficiently to get enough ore to pay expenses, and down to the 1,000-ft. level had produced ore to the value of \$229,847.92. The shaft was continued on down to the 1,400-ft. and

from that level the development ore netted the company \$48,113.20, bringing the ore shipments to date to \$277,961.12. These latest returns cover four cars of lead concentrates shipped to the East Helena smelter and two cars of zinc shipped to the Sullivan plant at Silver King. Part of the returns go to Hunter Creek Mining Co. under the agreement by which Hunter Creek Mining Co. drove the 1,400-ft. level to the east end of Lucky Friday's ground.

Ruth Mill Reopened

The Ruth custom mill located in the west end of Idaho Springs, Colo., has opened to process ore from the Franklin mine. Joe Ruth, manager, says that the mill will continue to operate if there is enough ore to keep the plant busy.

Ore from the Silver Plume district is expected soon and it is anticipated that other mines in this region will start shipping within the next few weeks. The Ruth mill ceased operation during the war as a result of the gold mines closing act.

Wheels of Government

(Continued from page 52)

mium Price Plan expects to liquidate about October 17 when, it is estimated, approximately \$60 million of the \$100 million authorized for the year ending June 30, 1947, will have been expended.

Boyd, U. S. B. M. Director

James R. Boyd, former Dean of the Colorado School of Mines, has received a recess appointment as Director of the U. S. Bureau of Mines. Dr. Boyd's nomination was sent up to the Senate by the President earlier this year and the Committee on Public Lands had reported favorably to the Senate, but in the closing hours of the congressional session the nomination was not confirmed.

The new Director is a graduate of the California Institute of Technology and received a Doctor of Science degree from the Colorado School of Mines in 1934. He was a member of the faculty of that school until 1940, when as associate professor of geology, he took a leave of absence to become Chief of the Metals Office in the office of the Undersecretary of War. He later went to the European Theater of Operations as a colonel and served as Deputy Administrator

1.t. Gen. Lucius Clay in charge of industrial operations in the American zone of the German occupation. As Executive Officer and Director of Materiel, with General Clay, he had charge of all mining in the American zone and collaborated with the British in the operation of coal mines in the Ruhr area.

The former Director of the Bureau. Dr. R. R. Sayers, is now serving as Chairman of the Medical Board established under the United Mine Workers of America Welfare and Retirement Fund.

NOW!!



- the handbook of coal mining progress all the papers and discussions of the 1947 Coal Convention
- practical information on modern coal mining methods and equipment
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Molded rubber connectors

* MINES new SPB Straight Pin Bigun Molded Rubber Connectors are today's outstanding buy for Portable Electrical Power transmission. They have a molded in Water Seal and threaded couplings that prevent accidental disconnects. Their use permits sectionalizing of cable to keep minimum amount in service and makes it possible to replace damaged sections quickly. Available for A. C. or D. C. operation with 2, 3 or 4 conductors. Also with pilot circuits to make connectors Permissible Type when used with MINES Safety Centers.

1 SPRING LOADED FEMALE SOCKETS



Female sockets in MINES Molded Rubber SPB Connectors are split sleeve, spring loaded and ring encased. This insures snug contact

along entire length of male pin and automatically compensates for normal wear. Solid ring, slip encasement prevents female ferrules from being damaged by overenlargement.

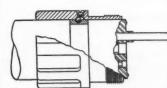
2 SOLID MALE CONTACT PINS



Male pins in MINES Molded Rubber SPB Connectors are accurately machined from low resistant rod material carefully

selected for strength. They are solid. No split ends to collect dust or increase resistance. Contact pressure maintained over entire length of male pin by springloading in female socket.

3 BALL BEARING TYPE COUPLINGS



MINES SPB Connectors are readily engaged or disengaged. Threading action of "fire-hydrantype" couplings quickly and positively connect or disconnect. The larger sized connectors have ball bearing type couplings permitting hand engagement and renewal of coupling members if damaged. See sketch at left for constructional details.

WRITE NOW FOR COMPLETE DETAILS

ON MINES OUTSTANDING NEW SPB CONNECTORS!

MINES EQUIPMENT COMPANY

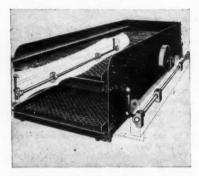
4229 CLAYTON AVE. MINES ST. LOUIS 10, MO.

MANUFACTURERS FORUM

Screen Uses Circular Action

Screen Equipment Company, Inc., of Buffalo, N. Y., is now manufacturing a complete line of single, double, and triple deck vibrating screens. Known as Seco screens, over 200 models are available for fine, coarse, light and heavy materials.

These screens operate on a circular



motion and extremely effective action for the graduation of materials is claimed by the manufacturers. Positive control of the gyrating action is also claimed with consequent decrease in shafts and bearings regardless of load conditions. Vibration is cut to a minimum by use of an equalizer assembly equipped with rubber bushings and requiring no lubrication.

Screen mountings are furnished with both removable and rigid panels. Lock crimp, wire cloth, slotted, and perforated plate screens can be supplied and models are available for screening limestone, coal, sand and gravel, and crushed stone of various types.

New G. E. Arc Welders Announced

A new line of General Electric heavy-duty single-operator d.c. arc welding machines, Type WD-40 series, have been designed for improved welding characteristics and a 50 per cent saving in over-all size and weight. Operating at 3,500 r.p.m., the new welders are available in 200-, 300-, and 400-ampere NEMA ratings.

New single dial, dual controls make it possible for the operator to preset the correct current for any given job without having to make other adjustments after the arc is struck.

With this current presetting ar-

rangement, a tap switch handle in the form of a pointer is set to the electrode size being used. It then automatically points out the proper one of several graduated scales on the face of the current-setting dial. This indicates the current range which should be used and permits precise adjustment of the welder output.

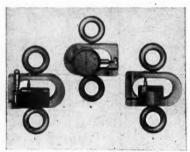
Short-circuit current peaks are adjusted to provide a stable arc with optimum striking characteristics. Instant recovery voltage is never less than arc voltage on any current adjustment, assuring high-quality welding over the machine's entire range of current. This also facilitates striking the arc. Quick response and control of overshoot makes this machine favorable for vertical and overhead work without excessive spatter. A broad current range makes it possible for all models to handle a wide variety of work.

The standard assembly includes a stationary welding generator, driving motor, control cabinet and panel, and a motor starter assembled into a single, compact unit. A two-wheeled, balanced running gear is available as an optional feature.

Safety in Weighing

A versatile "monitor" which weighs loads up to 10,000 lbs., flashes caution signal, rings bell, and cuts out the hoist motor on chain or cable hoist, and overhead cranes, is the new Dillon Dyna-Switch.

Made of special alloy tool steel, it



can be attached between overhead rail and hoist, or between hoist chain and hook in a few minutes. On cranes it is placed directly on hook.

After millions of stress cycles in tests, it always returns to true zero.

It is said to withstand accidental overloads far in excess of the limit called for by hoist or crane without affecting calibration.

The Dyna-Switch is made in the basic model, with motor cut-off; visual model, with red caution lamp; and weight model, in seven types; from 0-100 lbs. to 0-10,000 lbs., with indicators showing 1 to 100 lbs. divisions.

The switch is 7% in. from top to bottom of eye bolts, weighs 3¼ lbs. Switch is Burgess micro-switch type. For further information, address W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill.

Sparkproof Coal Mine Cable

A new cable that will not spark when short circuited has been developed by electrical engineers to aid in the prevention of coal mine explosions.

The new feature of the cable is a fine strand of copper wire embedded between the inner and outer layers of insulation. In the event of damage to the insulation the fine wire catches incipient current leakage before an arc can occur and carries it to a sensitive circuit breaker which cuts off the power. The cable was developed jointly by engineers of United States Rubber Company and Leonard Wilson of Kenilworth Mines of Utah.

Sealed-In Headlight

A new, smaller mine-machinery or locomotive headlight is announced by the Westinghouse Electric Corporation. Using a specially designed lamp like the automobile sealed-beam type, the new unit casts a brilliant beam more than 500 ft. ahead.

Two models are available, the type P headlight for use on locomotives or mine machinery requiring Bureau of Mines equipment approval in gaseous mines or explosive atmospheres and the type NP for general haulage locomotives for use on mine machinery in non-hazardous locations. Both headlights are equipped with plain cover glasses that, in conjunction with the prismatic lens on the sealed-beam lamps, produce a beam of the proper spread for the restricted passageways and tunnels in mines. A special lens is available for the type P unit that diffuses and spreads the beam for face

operations or where wider beam spread

Both models are built for heavyduty service. The lamp is encased in a rugged, semisteel housing for protection against damaging blows. The cover glasses are mounted so securely that they will withstand a distributed force of more than 3,500 lbs. pressure without shattering. The 150-watt lamp is suspended within the headlight on a spring-suspension system that acts as a shock absorber. With such protection, the new lamp gives several times the length of service at greater brilliance than any of its predecessors. Since the reflector is sealed in the bulb of the lamp, it retains its high reflective qualities for the life of the lamp.

One-Piece Alloy Scraper

Development of a newly-designed one-piece cast alloy-steel scraper, has been announced by the Cate Equipment Company, Salt Lake City.

Available for immediate delivery in 30-in. width for hoists of 5-6 hp., and 36-in. width for hoists 7½ to 15 hp., the scraper is heavy enough for rough digging, while the new design elimi-



nates all bolts and rivits in the body. It is stated that the rugged scraper rides evenly, pulling a full load on the horizontal or over rough bottom or uneven terrain.

Other features are a wide wishbone, one-piece body and a front shoe designed to pass smoothly over rock. The blade and shoe are renewable.

According to officials of the Cate Equipment Company, this scraper is an outgrowth of numerous requests from mining men for a piece of equipment of this type.

Combination Cable Holder

A new combination cable end and cable center holder which permits electrical cables of various sizes to be held securely has been developed by the Mosebach Electric and Supply Co., 1115 Arlington Ave., Pittsburgh, Pa. Typical uses are for pulling cables behind mine locomotives and

for suspending cables in deep holes.

The new cable holder can be used to hold cables either at the ends or at any point on the length of the cable. Cables are clasped in a few minutes simply by tightening the U-bolts, each U-bolt providing an individual grip on the cable.

— Announcements —

J. G. Green, who is widely known throughout the durable goods field, has been appointed mid-western rep-

resentative for the Baker Industrial Truck Division of Baker-Raulang Co., one of the largest manufacturers of power industrial trucks, tractors and cranes in the United States, it was announced recently by D. L.

Darnell, vice president of the Baker Company. He will assume his new duties immediately and plans to make his headquarters at 407 South Dearborn Street, Chicago.

For the past five years, Mr. Green was assistant general manager of the Philco Storage Battery Division, Trenton, N. J., in charge of sales, which brought him into close contact with leading industrial mining and utility companies throughout the United States.

The mining division of Kennametal, Inc., Latrobe, Pa., announces the appointment of Robert T. Smith to cover the state of Ohio as sales representative. Mr. Smith will be located in Glenshaw.

G. M. Patterson has been appointed assistant district manager for Indiana and Western Kentucky by the Cardox Corporation. He will have his headquarters in Evansville, Ind. Prior to his recent opportunity, Mr. Patterson had been employed for two years as mining engineer by Robinson and Robinson. Previously he had served for 5½ years as Chief Mine Inspector for the Commonwealth of Kentucky.

R. E. Martin has also joined the staff of the Cardox Corporation as mining engineer in the Pittsburgh district with headquarters at Library, Pa

New personnel assignments within the Distribution Division of the Cummins Engine Company, Inc., Columbus, Ind., have been announced by L. W. Beck, general sales manager.

S. J. Coffey, former manager of Cummins Diesel Sales Corporation of Illinois, has been appointed manager of regions. He will work directly under the general sales manager in supervising the activities of the Cummins regional offices.

Byron A. Duling has been appointed manager of engine distribution with headquarters at Columbus. In this capacity, he will have charge of all engine distribution to Cummins dealers and to manufacturers who use Cummins Diesels to power their equipment.

Raymond Boll has been appointed assistant manager of the Cleveland region, with headquarters at 805 Fidelity Building, Cleveland.

Hewitt-Robins, Inc., has announced the appointment of I. H. "Mike" Welch as sales representative covering the central Iowa territory with headquarters in Des Moines. Welch is an engineering graduate of the University of Wisconsin and has had a number of years' experience in the industrial rubber products field.

American Car and Foundry Company announces the following promotions in its mine car sales division, Earl C. Riegel as sales agent, succeeding R. A. Lockard who recently retired; and Karl R. Dietterick as sales



E. C. Riegel



K. R. Dietterick

agent in the anthracite territory, succeeding A. E. Smith who also has retired. Both gentlemen will make their headquarters at the ACF Berwick, Pa., plant.

Recent announcements of promotions in the Pershing Road plant of Link-Belt Company are:

Ralph W. Rausch, who has been assistant chief engineer at the Pershing Road plant, in charge of estimate-engineering since 1933, has been appointed chief engineer. He succeeds C. S. Huntington, retired.

Eugene P. Berg, who has served as assistant to the president since the recent death of E. L. Berry, vice president in charge of production, has been appointed general superintendent at the Pershing Road plant.



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PROPER CORES..

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SOLIDIFICATION FOR WET MINE
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STANDARD ENGINEERS NOTEBOOK

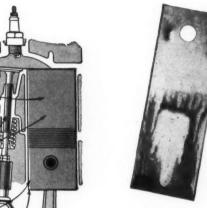
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① Adhering agent in RPM Compounded Motor Oil keeps oil film on all parts after engine stops, even on cylinder walls.

② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

③ No rust is formed to scrape off when engine starts, and cause excessive wear.

Constant lubricant film provides adequate and instant lubrication when engine starts.



This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.



RPM COMPOUNDED MO-TOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

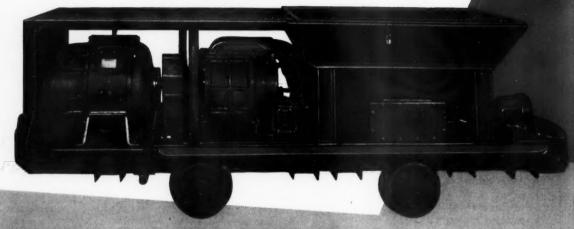
Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

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For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Colo.; Standard Oil Company of Texas, El Paso, Texas.

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The rapidity and thoroughness of this high-pressure machine enables complete rock dusting of the mine at lowest cost. The high discharge rate of the Type "S" Distributor—225 lbs. of dust and more per minute through 4-foot hose section, or between 90 and 100 lbs. per minute with 500 feet of hose—enables complete and efficient rock dusting of the entire mine. More dust applied per man-hour of operation keeps labor cost down; the richer stream of dust improves application on roof and ribs, without excess dusting of the bottom-another important economy in rock dust costs. Write for complete details.



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Here is a compact and convenient machine, small in size yet high in performance; discharging dust through 5 feet of hose, yet capable of being transported on an type of mine conveyance. The Bantam incorporates the outstanding features of the Type "S" Distributor abov and will maintain adequate rock dusting right in t working-places. Let us send you the descriptive detail

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